Institutionen för INFORMATIK vid Göteborgs universitet

TOWARDS CLARITY AND UNDERSTANDING

- A STUDY OF STRATEGIC SUCCESS FACTORS IN IT-MANAGEMENT

MASTER THESIS

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Authors:

Anna Eriksson 731024
Peter Falkengren 730503

Tutor:

Ph.D. Thanos Magoulas

SUMMARY

This thesis concerns the strategic success factors (SSF) of IT-management that forms the foundation of organisational development. According to our study this is characterised by:

- Holistic orientation

IT-management should be aware of both opportunities and threats generated by a turbulent and heterogeneous environment. A closed internal developmental philosophy can not remove organisational weakness or organisational blindness.

- Business orientation

IT-management should be aware of quality issues. The traditional view of evaluating the success of development in terms of costs does not indicate that the quality perceived by customers and suppliers have been improved.

- Social orientation

IT-management should be aware that goal priorities and resource allocation do not provide or support success. Only a co-ordinated philosophy that synchronises business development, systems development and organisational learning can secure success.

- Process orientation

IT-management should be aware that development can not be co-ordinated trough well-defined master plans or through intuition. Neither the comprehensibility of a heterogeneous and dynamic environment nor the continuity of human motivation can be managed by the traditional philosophies.

The foundation of IT-management is characterised by local and universal as well as temporal and non-temporal strategic success factors. The universal factors concerns IT and business alignment, organisational learning, IS effectiveness and strategic planning. These factors are relatively stable whereas local factors are unstable. The ability of management to keep these factors in harmony may be seen as situational strategic factors.

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Thanos, thank you for sharing your vast amount of knowledge with us. You made these years special.

Gothenburg, the 27 of May 1999

Anna Eriksson

Peter Falkengren

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PART I: INTRODUCTION

1 BACKGROUND

This section gives a background and an introduction into the IT-management area.

The impact of information technology (IT) on society increases with boosted capabilities of IT and higher IT-maturity. Percy Barnevik, the chairman of the Swedish investment firm Investor stated a couple of years ago that all firms are IT dependent (Pessi, 1998). This might be hard to grasp by companies that exist in an industry that historically has been very stable and very conservative. Companies have to find new ways of doing business to be able to compete in the dynamic environment of today.

Over the years the technical aspects of information technology have evolved at a fast pace. Technical aspects should perhaps assume a secondary role, with primary emphasis on system quality, user satisfaction, intangible benefits, organisational relevance and project management considerations. Organisations try to cope with these challenges through processes of information policy formulation and information planning. Both information policy and planning are aimed at focusing the attention of IT-systems on those areas that are essential for survival and strategic success of the organisation. Without information policy and planning the development of IT-systems can become haphazard to the organisation, inevitably resulting in excessive expenses, incompatible systems and angry users, but most of all: a diminished performance of the organisation.

IT-management is an area that has grown out of the need to master the above mentioned problems, and deals with how an organisation controls and develops its IS/IT. The concept incorporates more than just management of information technology. Magoulas and Pessi (1998) use IT-management as a common concept for management in a number of areas associated with the use of IT in organisations. IT-management is ”the skill that by design and use of IS/IT improve the information environment”. Information environments refer to the reality in which IT works with the attention on structuring and using IT to meet organisational and social goals. This master thesis comprise a survey of how the concept IT-management is being experienced by the international community in general and by Swedish organisations in particular incorporating an approach to present factors crucial to successful IT-management.

1.1 PROBLEM STATEMENT

Since IT-management is a complex area it seems there is a big need for ”best practices” within the IT-management area which forms the directions companies take. IT professionals seem to put forward single, successful practical experiences as a road to managerial success. As support to this a limited amount of successful stories complements the picture of a seductive message. IT professionals seems to think that a concept leading to success in one organisation automatically will also do so in other organisations. An example of this is the concept of ”total quality management ”. One single formula that will transform a mediocre organisation in to an excellent one seems to be what all IT researchers are looking for. Several examples indicate that almost any introduction of new IT into an organisation leads to additional and often new problems. Linear and non-dynamic approaches are not sufficient

as changes in the business environment and within the technological environment occur constantly (Galliers, 1998).

Organisations today exist in a turbulent environment. Many industries went trough traumatic and drastic changes in the late 80's and early 90's and companies were accused of "falling asleep at the wheel". Companies are finding that their strategies, capabilities, structures, values, skills and infrastructure are out of alignment and that they need new ways of management. The key for most companies is to find a way to compete globally while keeping the local responsiveness and agility (Ruddle, Stewart and Dopson, 1998).

The capabilities of IT are applicable over a range of functions and industries. Because of this, IT can be viewed as a general-purpose technology and not as a traditional capital investment (Brynjolfsson and Hitt, 1998). In this sense general-purpose technologies historically have had a disproportionate share of economic growth, contributing directly to economic growth and also as an enabler for innovations. Examples of other general-purpose technologies are the telegraph, the steam engine and the electric motor. These technologies lead to dramatic productivity improvements. The greatest improvements came however out of organisational innovations. An example is when the electric motor made it possible to place machinery in a way that improved manufacturing productivity by redesigning the workflow. The same can be said about the telegraph that made geographically dispersed organisations possible.

From the beginning IT applications focused on lowering the cost of accounting and payroll but the large effects of IT were revealed when managers redesigned operations to take advantage of low cost information processing and communications.

> *"Companies are pursuing new ways of organising work internally, new structures for interacting with customers and suppliers, and new types of products and services. These complementary innovations are often essential to the success of IT investments." (Brynjolfsson and Hitt, 1998)*

Technological aspects of IT are evolving at a rapid rate. There is often more functionality in IT than what can be exploited by the organisational members. According to Birchall (1995) this lead to a gap between business needs and the excess power of technology. Technology is getting faster and better at a higher pace than organisational IT maturity evolves, this gap is portrayed in figure 1. By mastering this relationship companies can use all of the potential that IT allows and perhaps become more successful than its competitors, this is a part of IT-management.

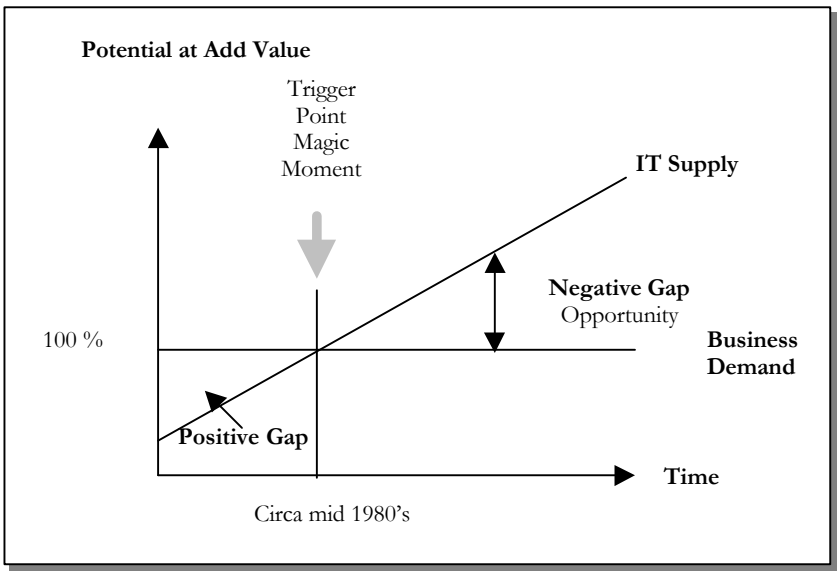

Figure 1: The era of the negative gap (from Birchall & Lyons, 1995)

Human aspects are starting to get a more dominant role in IT-management questions. IT researchers seem to neglect many important social and environmental factors when they consider IT to be a main factor in organisational transformation (Galliers, 1998). Change is vital to the success of many companies but not all changes result in significant improvements and it also put great strain on the people within the organisation. New ways of working that people are unaccustomed to, with day to day changes are common. Information technology leads the way into new forms of collaboration. People employed within IT intense industries are even more exposed to rapid changes.

Why is all this interesting in a thesis with the subject: success factors in IT-management? We feel that the relationship between IT and the business has to be carefully managed. Investments in IT might be undertaken on false premises and they might have to be evaluated in a better way. If there are great gains from investments in IT and these investments are not undertaken because of negative views of actors, important business opportunities might be missed.

We wanted to write our final thesis within the IT-management area. Our alignment when pursuing a Degree of Master of Science in Informatics (Systemvetarprogrammet), Strategic IT-management made the choice easier. Since we wished to conduct an empirical study, we contacted several Swedish companies and proposed to perform a combined theoretical and empirical study in collaboration with them. We soon realised that it would be to time consuming for us to collaborate with more then a few companies and we therefore concentrated our efforts to four companies and out of these we studied one company in depth.

1.1.1 OUR WORKING DEFINITION

We have constructed the following figure (figure 2) to better understand IT-management and describe how we think that IT-management is related to organisation, strategy and environment. To conduct successful IT-management these relationships have to be carefully managed and all the parts are needed. We use this model to confirm the validity and reliability of our research.

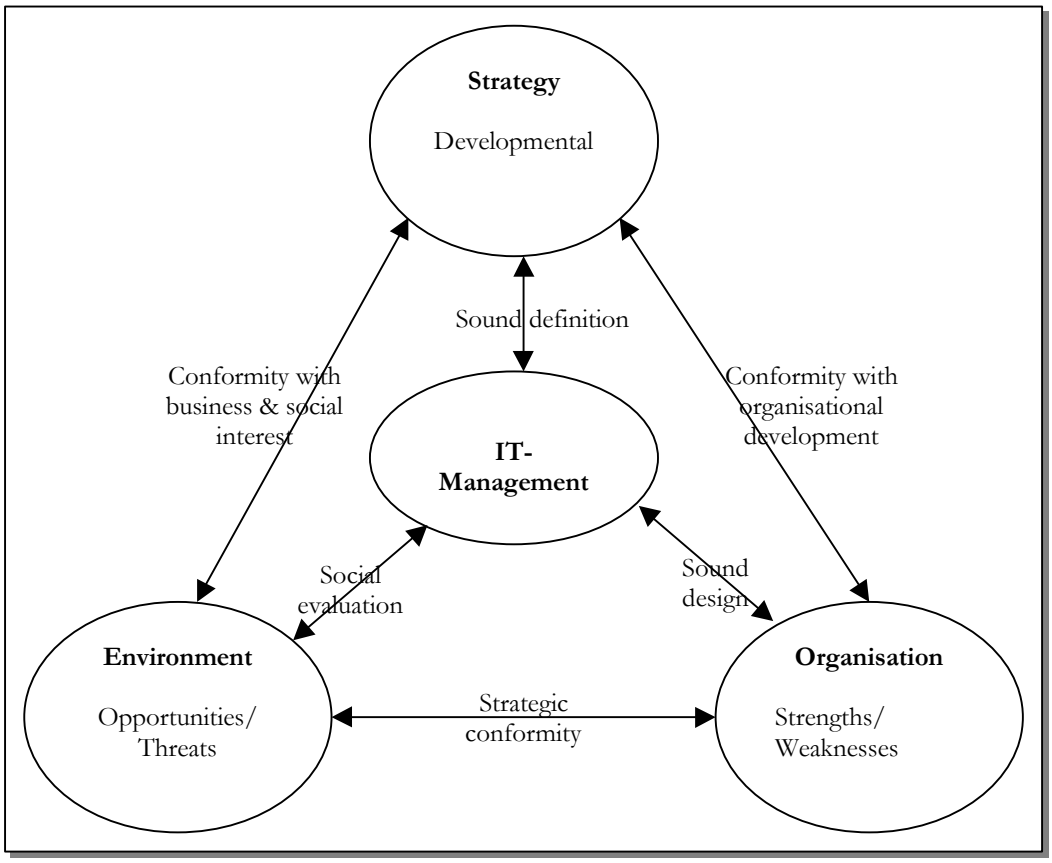

Figure 2: How we view the world

1.1.2 MAIN CONCEPTS

Some of the concepts that we use in our thesis are not easy to define, and they are often used in different ways depending on circumstances. We will therefore account for a common interpretation of these concepts below: (Ansoff et.al, 1976), (Earl, 1989), (Magoulas and Pessi, 1998) and (Morgan, 1995).

- **Organisation**: Organisation derives from the Greek organon, meaning an intellectual tool or an instrument to arrange something (knowledge or human activities or ideas etc.). An organisation is traditionally seen as one single company that operates in one market. Today the truth is somewhat different; more then one company can form an organisation as a result of a merger or when two companies form a partnership to for example gain competitive edge. Organisations are formed

entities that work towards a common goal/agreement and they are becoming more independent of geographical borders.

- **Environment:** The environment constitutes all that is outside the actual organisation. A distinction can be made between immediate and secondary environment. The immediate environment is an aspect of the total environment that has a tangible input-output relationship with a company. The secondary environment does not have such a tangible transition relationship with the company, though it may sometimes exert a substantial impact upon company's behaviour concerning culture, technology, politics and society.

- **Information systems (IS) strategy**: Concentrated on aligning IS development with the business needs and seeking strategic advantage from IT. The IS- strategy is about what to do with the information technology.

- **Information technology (IT) strategy**: This strategy is primarily concentrated on technology policies, like architecture, including risk attitudes, vendor policies and technical standards. The IT-strategy provides the framework within which the specialists provide applications and users use them. It focuses on how organisational activities can be supported by information technology.

- **IT-management (IM) strategy**: This concept comprises the policies, procedures, aims and actions likely to be identified from using IS/IT, its role and the structure of IT activities within the organisation. IT-management focuses on the relationship between management and end users. Whereas the IS-strategy is about 'what' (ends) and the IT-strategy is about 'how' (means) the IM- strategy is about the 'wherefore' questions about responsibility and executions within the organisation. This is displayed by Earl (1989) in a frequently used model (see figure 3).

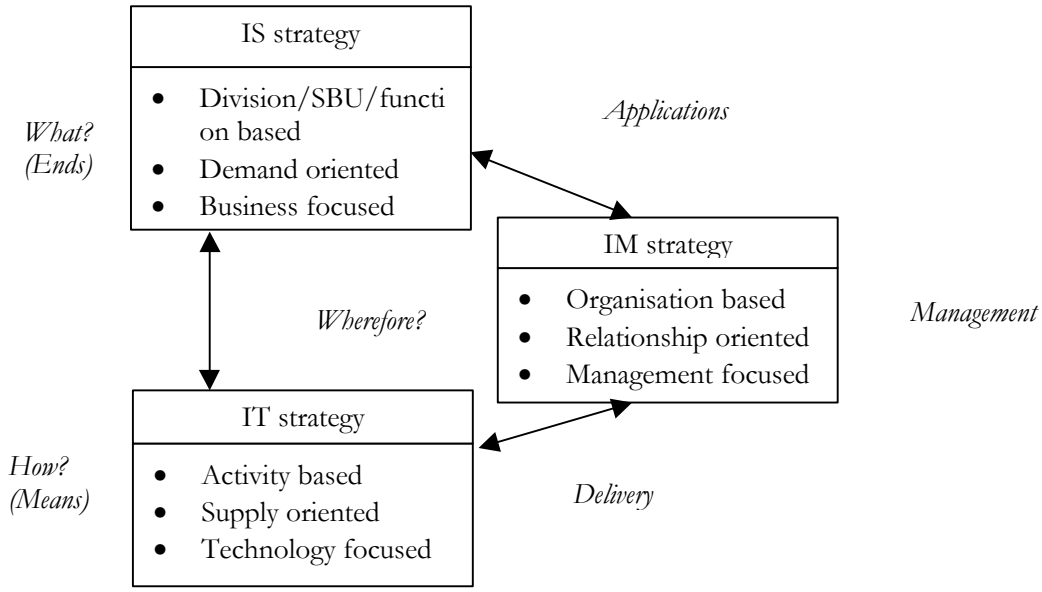

Figure 3: Three levels of strategy (from Earl, 1989)

- **Strategic IT-management**: In the context of our work strategic IT-management means striving and struggling with issues of quality. Not just information-, technical- or instrumental quality but the underlined sense of social quality i.e. identity, integrity, security, equal development of opportunities, quality of working life etc. This means that the fragmented conception of business objectives such as marketing, market position and service quality are not enough to support the rise of strategic IT-management because of fragmentation, incompleteness and inequalities.

1.1.3 EMPIRICAL STUDIES

1.1.3.1 COMPANY *A*

Some Swedish companies were interested in participating in our study, however they felt it would be too time consuming for them to participate. Company *A* was one company that wanted to co-operate with us and since their main office is located in Gothenburg this was a good solution. We were interested in Company *A* since we knew that they work a lot with IT-management questions.

We contacted the IT-manager of one of the business areas. The company is interesting because their strategy is focused on developing new concepts to meet their customers future needs. The company is committed to find more efficient ways of producing, share experiences and knowledge-management, mainly through increased specialisation and a well-built IT-infrastructure.

An extensive IT-project was initiated in 1995 with the purpose to rise the efficiency and the profitability of the group. New systems will be delivered to nearly all business areas within the near future. Sites and offices get new information systems that make the production- and sales-process more effective. Today the company has got a standardised IT-infrastructure and a common environment for electronic mail with over 3000 users. Internet and Intranet are a natural part of daily work in the organisation at least at management level.

The IT-manager gave us access to the organisation. He was interested in getting the organisations IT-management studied and he also wanted to learn more about strategic success factors in IT management.

1.1.3.2 OTHER COMPANIES

We also interviewed the IT-controllers/IT-managers of three Swedish companies. They were willing to contribute with their experiences to enrich our study. We did not study their organisations instead we used the material from the interviews for our analysis.

1.2 RESEARCH PROBLEM

Against the background described above we have become interested in strategic IT-management. We are going to study issues that have been judged important in strategic IT-management to get a clearer and more understandable picture of the strategic IT-management area.

> *What issues may be treated as strategic in IT-management and how are these issues affected by the dimensions of room and time.*

1.3 PURPOSE

The purpose of this master thesis is to identify, analyse and validate strategic factors of successful IT-management. It is our understanding that the majority of studies conducted within the area are non-Swedish, therefore we have the ambition to compare if and how these factors vary over time and with physical location (between different countries). We take the opportunity to analyse factors that are of great interest to us and that might be of great interest to others. We hope that the conclusions from this study in the future might function as guidance to strategic IT- management. By creating conditions for successful strategic IT-management, it is possible for organisations to utilise information technology to the maximum and thereby generate effects in the business. The purpose is not to find an absolute road to success; we feel that this is impossible since organisations exist in different and changing environments. Instead we want to identify factors that have been proven important to successful strategic IT- management and thereby present a clearer and more understandable picture of strategic IT-management.

1.3.1 PERSPECTIVE

When conducting this study we have chosen a rather objective standpoint since we have not taken part in the research leading to the results in the literature that we have studied, nor are we employed by the companies involved. Due to the social profile of the Institution of Informatics in Gothenburg, our values have more of an end user perspective then that of top down management. This is somewhat compensated for by the fact that many models within the area is of a top down nature. We try to conduct our research in a holistic way with the notion that business is in need of long term revenue to be successful or even to continue its existence. We see great benefits in being as objective as possible since we feel this will give us a greater understanding of what really leads to success within the IT-management area. However, we need to realise that we are coloured by our studies and this will limit the objectiveness of our research.

1.4 PROBLEM DELIMITATION

When writing a thesis, it is of importance to delimit the study. This is due to the fact that the researcher needs to concentrate on specific issues within the problem area, instead of describing all possible problem areas. If we as researchers did not delimit, the thesis would probably be very unfocused, lack relevance and also become too comprehensive. Moreover as we have a time restraint of 20 weeks for this thesis, we need to delimit the study to be able to finish in time. In this section we present the delimitation that we made in our theoretical framework.

In this study, neither questions of technical character, specific cost benefits analysis or methods on how to measure these are explicitly analysed. Technical aspects are treated as an important factor but we do not go into specific discussions on brands or special technical equipment. We realise that cost is an essential factor that has to be considered in every decision taken. It is however extremely difficult to predict costs within the area due to rapid changes in the environment (Pessi, 1999). Instead we present a frame within which IT can be utilised successfully. We are aware of the fact that this might limit the usefulness of our study, since many IT-management decisions are dependent of the above mentioned issues.

1.5 GOALS

This thesis is supposed to give us a deeper understanding of the problem area. We believe that this will be very interesting in the future because information technology, used in a way that fits both organisational and individual goals, might be a strategic tool for collaboration and competition. Our ambition is that this thesis will contribute to the improvement of IT-management knowledge, and that it will be used as an aid to provide clarity in the understanding of IT-management.

Our academic ambitions are high and this is the proof and outcome of our four years of studies within the area of Informatics with a major in Strategic IS/IT-management.

1.6 COURSE OF ACTION

To fulfil our purpose we will study existing literature within the area, thus converting theoretical knowledge into fruitful questions to investigate. We will present issues that have been identified as important in earlier studies.

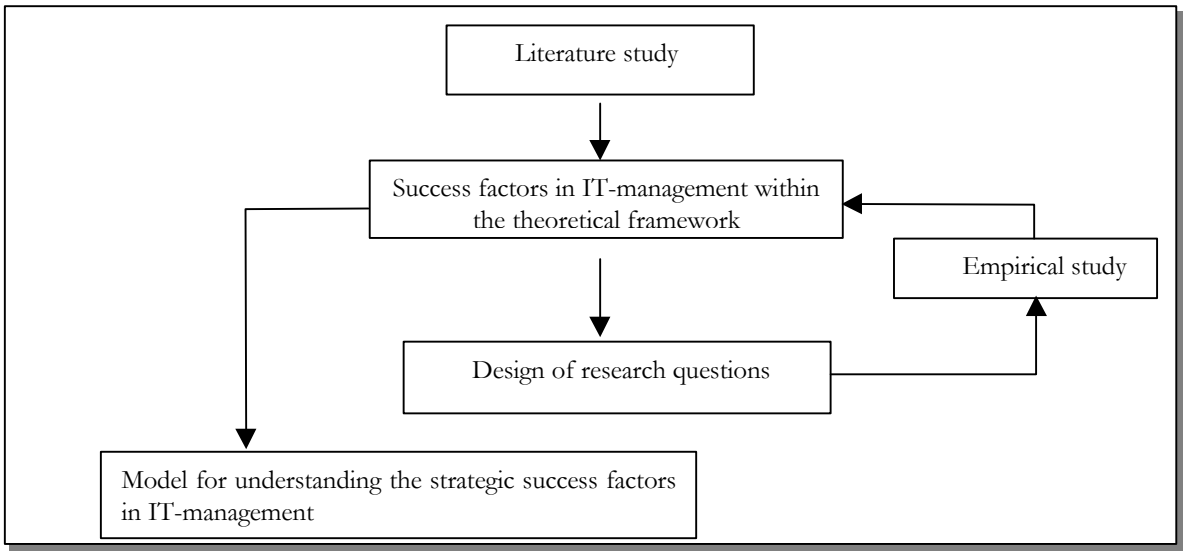

Figure 4: Course of action

When our theoretical study is finished we will start investigating how IT- management is performed within the Swedish business community. We are going to study one organisation in particular and conduct interviews with IT-managers of three Swedish corporations. This will give us a greater understanding of how IT-management is conducted in Sweden at the present time. This study is naturally performed in an iterative fashion (see figure 4) implying that we will have to go back and study literature at every point of the thesis to confirm our findings.

We will compare Swedish organisational life and studies presented in literature with foreign studies performed within the area of IT-management. By analysing our findings we can see if there are any special conclusions to be drawn.

1.7 DISPOSITION

This thesis is divided into eight main parts namely: Introduction, Method, Theoretical framework, Analysis, Results, Discussion and Conclusion, References and Appendix. Every new section of this thesis starts with a short description to guide the reader.

Part I: Introduction
Gives a background to our study. Purpose and goals are presented.

Part II: Method
Describes the research process, the chosen research approach and how we gathered data.

Part III: Theoretical framework
Theories fundamental to our research are presented as well as the theories that we will use to classify our findings.

Part IIII: Analysis
Literature and empirical findings are presented as well as our models of classification and analysis.

Part V: Results
The results of our findings are displayed here.

Part VI: Discussion and Conclusion
This part presents discussion of results as well as conclusions.

Part VII: References
References are listed.

Part VIII: Appendix
Presented issues are explained.

PART II: METHOD

2 DESIGN OF RESEARCH

In this section we will briefly summarise the proceedings of our research process.

2.1 RESEARCH PROCESS

At the start of our research process, we set the goal to finish our thesis within nineteen weeks, on the 21 of May to be exact. During the first week we met with our tutor to discuss the choice of subject. We realised that IT-management was a faceted subject that could be seen from many different perspectives. Since we wanted to conduct some sort of empirical study we contacted several Swedish companies. We got in touch with company *A* and decided to work with them in our study. We also got the opportunity to interview the IT-controllers/IT-managers of three Swedish companies.[1]

To increase our subject knowledge we searched through the large collection of articles, literature and other thesis related to the subject at the university library in Gothenburg. Our tutor, with his immense knowledge of literature within the area was a great help in this search. The study proceeded for several weeks, and focused on the study of literature. We continued to collect a huge amount of literature on the subject at the library, on the Internet, and a considerable amount of material from our tutor.

When we had come far enough in our study of literature we discussed with company *A*, what persons to interview in order to get a deep comprehension of IT-management in the company. We selected eight people at company *A* to interview and one at their outsourcing partner, who we through the IT-manager of company *A* then contacted by mail and we followed up by a phone call to decide the exact date for an interview. We also contacted the other IT-managers that we wanted to interview. We fortunately managed to make appointments with all but one of the respondents.

When contacting the respondents we had only specified which areas we would discuss so now it remained to construct our interview framework. When deciding the interview questions we wanted to ask all the respondents the same questions in order to be able to conduct a comparative analysis. However, we needed to modify the questions depending on what function the respondent had in the organisation. In the interview guidelines we have tried to cover the issues discussed in the theoretical framework in order to see if the literature study findings conforms to Swedish organisational life.

When we had conducted the interviews we were almost finished with the last stage of the framework of the thesis. It remained to write down our findings, drawing conclusions and making clear that we had a good match with theory.

[1] See empirical studies

3 SCIENTIFIC FRAMEWORK

In order to solve a research problem a research approach has to be chosen. Several authors discuss different methods and classifications. The type of approach that is appropriate depends mainly on the nature of the research problems under investigation and the amount of knowledge the researcher already has in the research field. A good design ensures that the data collected is consistent with the objectives of the study and that the information is correctly gathered.

The word method originates from the Greek word methodos, to walk down a road (Åsberg, 1996). Methods describe steps that must be taken or how something will be performed. The word method is normally used in a narrow meaning; ”interview method”, ”inquiry method” etc. The term method points in this case towards the level where phenomenon is codified in other words; listed as data.

There are distinct research methods to explain different kinds of problems. Inferior research is conducted when a certain method becomes so dominating that the research question is adapted to this method instead of letting the question determine the method. Problem formulation and research reflections should therefore precede the method choice. On the other hand it is necessary to have a genuine knowledge of the different methods to be able to adopt the empirical instrument fit to highlight the problem to be investigated.

3.1 PHENOMENOLOGY OR POSITIVISM

We decided to choose between the phenomenological and the positivistic approach (see table 1). Since our study is based on an empirical research of people’s experiences and thoughts where profound interviews are central to the study, we found that the phenomenological approach was best suited. Furthermore we think that it is almost impossible to stay objective as recommended by the positivistic approach. The truth, according to positivists is found by following a method or a research that is in many ways independent of what you are studying. Every influence from the scientist should be eliminated or minimised. By selecting Strategic IT-management as our major and by opting our research question, we have already chosen our standpoint and we are thus not free from a preconceived notion. By working with words and not with numbers we intend to conduct a research of qualitative sort. Although there is a clear dichotomy between the positivist and phenomenological world views where a sharp differences of opinion exist between researchers about the desirability of methods, the reality of research also involves a lot of compromises between these pure positions (Esterby-Smith et al, 1996).

Table 1: Key features of positivist and phenomenological paradigms (from Easterby-Smith et al, 1996)

	Positivist paradigm	**Phenomenological paradigm**
Basic beliefs:	• The world is external and objective. • Observer is independent • Science is value-free	• The world is socially constructed and subjective. • Observer is part of what observed. • Human interests drive Science.
Researcher should:	• Focus on facts • Look for causality and fundamental laws. • Reduce phenomena to simplest elements • Formulate hypotheses and then test them.	• Focus on meanings • Try to understand what is happening • Look at the totality of each situation • Develop ideas through induction from data
Preferred methods include:	• Operationalising concepts so that they can be measured • Taking large samples	• Using multiple methods to establish different views of phenomena. • Small samples investigated in depth or over time.

In a choice between questionnaires and interviews we find that for our research question interviews will be best suited. The most fundamental of all qualitative methods is that of interviewing (Esterby-Smith et.al, 1996). By talking to people in the organisation we can picture how they experience their world and thus we hope to get a fair representation of the organisation. We hope to get a closer contact with the organisational members then we would have if we had only sent out questionnaires. Since our research question is qualitative the qualitative interview seems like a natural choice. This interview method is a sensitive and powerful way to capture experiences and significances from the interviewed people's daily life (Kvale, 1997). Through the interview they get the possibility to communicate their situation to the interlocutor in their own perspective and with their own words. By interviewing people in different organisations we will try to come up with a pattern from which we will extract the strategic success factors in IT-management.

3.1.1 QUALITATIVE VERSUS QUANTITATIVE TECHNIQUE

In those studies were data is not analysed efficiently in a quantitative way, qualitative research is appropriate. Easterby-Smith et.al (1996) explains that in this type of research a small convenience or quota sample is used and the information sought relates to the respondent's motivations, beliefs, feelings and attitudes. An intuitive, subjective approach is used in gathering the data and the collection format is open-ended. Therefore the analysis and interpretation of data is more subjective in qualitative research than in quantitative research.

It is important to note that the qualitative approach is not intended to quantify or precisely measure a problem statistically as in the case of the quantitative data collection technique. Quantitative technique samples are drawn scientifically and coded to be analysed quantitatively. This type of research includes large-scale surveys, experiments and time-series analysis. Qualitative research projects are often less structured in the beginning of the project, compared to quantitative research and are therefore applicable when the study is of an exploratory nature (Easterby-Smith et.al, 1996).

This paper has employed qualitative methodology because it is a more appropriate way to investigate an area in which a few previous studies have been done. A qualitative approach also enables the study in a natural setting, allowing the investigator to answer 'how' and 'why' questions and thus understand the nature and complexity of the process taking place. Since we were interested in feelings, attitudes and beliefs that the respondents had towards IT-management we used the qualitative technique when collecting data for our study.

4 GATHERING DATA

As mentioned earlier our study is of a qualitative nature. We have gathered information by conducting both literature and empirical study. This has increased our knowledge and understanding of the IT-management area. We will discuss here the collection of our data, that is, which data sources we have used, how the study of literature and the interviews were performed, sources of errors in the study and finally evaluation of the study.

4.1 DATA SOURCES

Data sources can be divided into five basic sources of data information: respondents, analogous situations, experimentation and primary and secondary data (Easterby-Smith et.al, 1996).

4.1.1 RESPONDENTS

There are two main methods of gathering data from respondents: communication and observation. Communication requires asking the respondents questions, and this is the most common method. This method is often used to find out what people think, and it is important that the questions are not biased and that answers are honest.

Observations are the process of recognition and recording of events and objects, i.e. observing what people do and how they do it. This method records what is happening but not why something happens.

4.1.2 ANALOGOUS SITUATIONS

This data source is an examination of cases similar to the one actually studied. Analogous situations include case studies and simulation. The case study method is used to investigate similar and relevant situations; for example a previous study made in the IT-management field can be used to draw conclusions relevant for our study. This method is especially useful when a complicated series of variables interact and result in a problem or an opportunity.

Simulation is the creation of an analogy of a real-world phenomenon, most often by using computer programmes. Since simulations can be done in a laboratory or an office, this type of research is less expensive than the use of surveys or test marketing. It may also be less time consuming. The limitation of simulation is that it is difficult to calculate the variable to be used.

4.1.3 EXPERIMENTATION

This method is similar to simulation in its approach. One or more variables are consciously manipulated in order to derive cause and effect interrelation. Examples of experimentation include increasing the educational efforts and then measuring the effects, investigating attitudes before and after a specific project, using different educational programs in different geographical areas, and then observing their effects.

4.1.4 PRIMARY DATA

This is data that researchers collect for the first time. Personal interviews are one of the most important primary sources of information. This takes place when the researcher communicates with the respondents in a structured way. The respondents can provide important insight into a situation enabling the researcher to identify other relevant sources of evidence. However, the researcher must be aware of the fact that interviews are verbal reports, and as such can be subject to the problem of bias, poor recall and poor or inaccurate articulation.[2]

4.1.5 SECONDARY DATA

Secondary data, in contrast to primary data, consists of data already collected and published for another purpose than for the conducted research. Secondary data can originate from internal or external sources. Internal sources are from within the organisation and may include annual reports, sales reports, budgets, etc. External secondary data include books, reports and other publications.

There are several advantages in using secondary data as it is less expensive than using primary data, and it is also less time consuming. Secondary data is sometimes so wide-ranging and sophisticated that it would be impossible to collect it yourself. Disadvantages of using secondary data are the limitations in the accuracy of the publications and that information needs of the study do not always coincide with the data obtained.

4.1.6 APPLIED DATA

Our study is based on literature studies and interviews, i.e. the use of both analogue situations, primary and secondary data. The primary data comes from respondents and conversations with our tutor at the Institution of Informatics. The external secondary data consists of the extensive lists of books and articles that we have read. The internal secondary data comes from *company A* and consists of annual reports, organisational charts and other relevant organisational reports that were used to make the interviewing easier.

[2] See further 4.4.5 Sources of errors in specific research sectors of the study

4.2 STUDY OF LITERATURE

The success of a study can many times be found in how well the researchers have conducted their literature study. In conducting any kind of research the authors have to study theories on the subject. When a research question has been formulated, an obvious element is to find out what has previously been written and presented. It is hard, probably even impossible to conduct exemplary research without consulting earlier work. Former accomplishments help the researcher to formulate an interesting question and to choose the appropriate method (Backman, 1998). The literature can also give valuable guidelines about difficulties and merits.

The literature study should point out earlier mistakes and knowledge gaps, and indicate how relevant the chosen research question really is. Through literature, ideas are given on how conceptions within the area are defined, specified and used in empirical studies. The researcher can study how methods and methodology can best be used and how to handle data (qualitative or quantitative techniques) and how to interpret findings. The review of past documents also gives an interesting historical perspective, certainly in the information technology field where the development has gone tremendously fast.

The main purpose of the literature study can be summarised accordingly

- Give an overview of earlier collected knowledge within the area
- Point at the significance of the research problem
- Indicate the research front
- Indicate problems (knowledge gaps, contradictions, scarcity)
- Make the problem formulation easier
- Make the concept formulation easier
- Give method and design suggestions
- Give different interpretation alternatives
- Give a historical perspective

There are conflicting perceptions about the literature study. The view of phenomenological researchers has been presented, but some researchers mean that by studying previous documents the researcher can incorporate stereotypes, prejudged and preconceived notions about a subject, which might affect the study. They even fear that new discoveries might be neglected because of this. This is mainly the view of positivistic researchers.

When choosing the literature the researcher must be selective to prevent an information overload. The assignment would be to large if care is not taken when selecting the literature to study. Further it is important to begin the actual writing during the literature study because if the researcher waits interesting connections and patterns could be forgotten before it is time to put them on paper.

4.2.1 HOW WE CONDUCTED THE STUDY OF LITERATURE

In our study the intention with the literature study was to derive the significance of questions to be constructed to form our interviews and to present earlier studies within the IT-management area. When selecting among earlier studies, we worked after the following specifications:

1. Reliability of the study, originating from a reliable source.
2. Represent different countries.

Our interview questions were based on patterns that we saw in earlier studies, how questions in these studies were presented and also based on our theoretical framework.

4.3 INTERVIEWS

We used semi-structured interviews because they are a valid approach for data collection in qualitative research (Benamati et.al, 1997). Interview subjects were chosen to represent different roles in the organisation to give the research different perspectives.[3] Subjects received a brief letter explaining the study and soliciting participation in the interview. They then received phone calls to answer any questions they might have and we scheduled interviews at a convenient time and place. A total of 12 out of 13 individuals agreed to participate, this indicates that IT-management is an area of great interest. We were both present at all the interviews and we took extensive notes, cross-referring and transcribing them shortly thereafter. These notes together with the literature findings were used as raw data for the analysis. With the subjects permission one of the interviews was recorded on audiotape to facilitate the transcription.

4.3.1 INTERVIEW DESIGN

The interviews lasted an average of 60 minutes. At the beginning of each interview we briefly explained the study and the structure of the interview. All interviews where conducted in the same way and similar questions where used at every encounter to ensure the conformity of the study. The interviews were performed in an unstructured way where we discussed around different subjects rather then directly about them. We did this on purpose to get the interview subject more relaxed and open-minded because we think that an interview that is too structured, can limit the usefulness of the interview since it can take the form of a questionnaire and that is not what we were after.

4.4 EVALUATION

It is almost impossible to completely exclude research errors. Therefore, an evaluation of possible errors in the research ought to be done. The types of errors can be divided in systematic and random errors, that is a constant bias in the measurement. Random errors are non-systematic errors (Easterby-Smith et.al, 1996).

[3] See Interviews in References

4.4.1 VALIDITY

The concept of validity tells us if the data collection method used has the ability to measure the qualities intended to be measured. The validity measure refers to the extent of which the measurement is free from both systematic and random errors (Kinnear and Taylor, 1996). This means that through measuring the validity we get to know if the applied method is reliable. According to positivists, validity deals with the question ”Are we measuring what we think we are measuring” but the phenomenological asks ”Has the researcher gained full access to the knowledge and meanings of informants” (Easterby-Smith et al, 1996).

Validity can be divided into inner and external validity. Inner validity is the extent the results are in accordance to reality. External validity describes to which extent the results are applicable to other situations than the described. If the studied subject is unique, the question of external validity is impossible to answer.

4.4.2 RELIABILITY

Reliability refers to what extent the results would be the same if the study was repeated. It measures therefore the methods ability to resist the influence of chance and to be consistent and accurate. Only the accuracy of what is actually studied is taken into consideration, which means that a study can have a high degree of reliability even though the research findings do not answer the research question. Reliability is concerned with the consistency, accuracy, and the predictability of the research findings and refers to the extent the results can be repeated. With high reliability the operations of a study can be repeated by a later investigator and still arrive at the same findings and conclusions. Therefore the goal of reliability is according to Yin (1989) to minimise the errors and biases in a study.

4.4.3 GENERALISABILITY

The validity and reliability of the study are both important for the generalisability of a study. If a lot of samples are studied it is easier to draw general and not for the study specific conclusions. The phenomenological researcher wants to know how likely it is that ideas and theories generated in one setting also will apply in other settings (Easterby-Smith et.al, 1996).

4.4.4 SOURCES OF ERRORS

The validity of research is dependent on the size of sampling and non-sampling errors. Non-sampling errors are, for example, a faulty purpose, wrong research design and content, and errors in data processing and analysis. Sampling errors regard the difference in value between the selected sample and the total population. Samples are not used in our study, therefore the potential sources of errors will be non-sampling errors.

4.4.5 SOURCES OF ERRORS IN SPECIFIC RESEARCH SECTORS OF THE STUDY

4.4.5.1 MANAGERS

Research into managers and management provides a case where the subjects of research are very likely to be more powerful than the researchers themselves. Managers tend to be powerful and busy people. They are unlike to allow research access to their organisation

unless they can see some commercial or personal advantage to be derived from it. This means that access for fieldwork can be very difficult and may be hedged with many conditions about confidentiality and publication rights; feasible research questions may be determined more by access possibilities than by theoretical considerations. Managers very carefully value their time and therefore they often prefer short interviews.

4.4.5.2 GENERALISABILITY

Studying only one organisation in dept has limited the generalisability of our study but we supplemented our work with interviews with IT-managers of three other organisations. This does not exclude that our study is limited but by doing this, our results could be a bit more generalised.

4.4.6 EVALUATION OF THE STUDY

4.4.6.1 VALIDITY

In this thesis validity has been defined in terms of our working definition of the concept IT-management and its relationship to: strategy (definition), organisation (sound design) and environment (social evaluation).[4]

4.4.6.2 RELIABILITY

The issue of reliability can be given in terms of the correctness of published studies as well as in terms of the correctness in interview material (collection and processing)

[4] See 1.1.1 Our workning definition

PART III: THEORETICAL FRAMEWORK

5 MANAGEMENT

Views on 'management' are multifaceted, and clearly the notation of management as an activity is not new. Formal records of production management techniques can be traced back to Mencius (372-289BC). This Chinese philosopher dealt with models and systems, and pointed to the advantages of the division of labour, which puts the concepts rediscovered 2000 years later into perspective (Easterby-Smith et al, 1996).

5.1 WHAT IS MANAGEMENT?

Distinctions can be made between management as a 'cadre' of people, and management as an activity. Management as a cadre are the members of an organisation who carry the title of manager and who commonly share similar beliefs about their status and right to manage. Usually the title manager is given to people in the organisational hierarchy who are at one or more levels above 'first line' supervision. This definition can be applied most easily in a traditional manufacturing company. However, with the growth of the service sector, and the move from hierarchical structures to flatter organisation structures which stress the importance of commitment, multi-skilled teams, minimum status and harmonisation, the traditional means of defining a manager is becoming increasingly problematic.

The modern use of the term management derives from the United States, with the requirement for business and entrepreneurial skills at the turn of the century when American industries and railroads were developing rapidly. From the beginning management was put forward as an important subject that could, and should, be taught in higher education. A further impetus was given to management after 1945 by the widespread development of business schools outside the US, and by the attempts of US schools to seek greater academic respectability for their disciplines.

During the 1960s the view evolved that the key to effective management was the ability to make decisions, particularly under conditions of uncertainty. This decision theory approach therefore emphasised the importance of techniques that could be used to analyse the environment within which decisions must be made, and ways of reaching decisions which will work as well as possible, even if they are not completely ideal. Quantitative methods of analysis and model building still dominate many business schools, especially in the US and France.

Management remains a unique style and it can not be seen as a universal model because management is situational. The issues faced by management may be universal but the strategy employed by management is situational and knowledge is not enough to facilitate the enterprise of IT-management (Magoulas, 1999)

6 IT-MANAGEMENT

While management can be seen as the art of improving social realities, work conditions, communication and co-operation, IT-management can be seen as the art of using information technology to provide social goals and intentions.

6.1 DEFINITION OF IT- MANAGEMENT

IT- management deals with questions concerning organisation of IT, responsibilities and authority, and to handle or avoid risks that evolve and might jeopardise successful IT-management. IT- management includes handling problems that deals with applying new technology, development of new information systems, maintenance of existing investments in IT and in a long range perspective utilise and develop the possibilities that IT offer. This includes new ways of conducting business (Magoulas and Pessi, 1998).

6.2 HISTORY OF IT-MANAGEMENT

The history of the IS/IT area can be divided into at least three eras: data-management, information-management and the network era, see figure 5. These eras mirror how IT has been used and what has been seen as relevant management questions (Earl, 1989), (Ward, Griffiths et al. 1990) and (Brancheau, 1997).

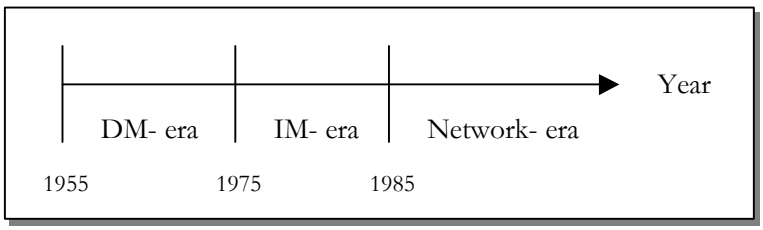

Figure 5: The history of IT-management

- The data-management era (1955-75):
  Computers where mainly used for issues related to calculation such as accounting and other administrative tasks. Computers in technical control and steer function where tailor-made. The IT-personnel worked separate from the rest of the organisation and they developed their own culture and terminology. The responsibility for IT was delegated to computer experts who were not normally included in company management.

- The information- management era (1975-85):
  The PC-revolution resulted in a development of more advanced systems for daily work and technical functions and the relation between price and performance was radically improved. IT-managers in many organisations started to approach the company management but questions usually stayed at cost handling and technical matters. Many companies were now dependent on administrative systems to be able

to manage their daily activities. IT-systems influenced many questions outside mere data-management such as organisation of work, manning, economy and inter-organisational co-operation. This era involved the will of organisations to control and influence the development of IT usage both from an efficiency- and a usage perspective. These questions grow so big that the traditional IT-managers could not handle them.

During the 70´s management information systems strengthened its position within organisations. In business declining markets, the US auto industry demonstrated how competitive globalised markets were becoming. Information was starting to be viewed as a resource but data processing was still practised as a technical speciality that resulted in demands for involving business managers in the development of new computer applications. Information systems were placed centrally within the company. The IS organisation monopolised servicing the organisations information needs and had almost total control over technology infrastructure and applications. There were only few alternatives outside the company that could provide the above services and IS managers were put under attack in leading business journals. First generation database, data communications, and real-time on-line systems were new technologies and it was considered critical to keep up with these technologies so that systems did not come crashing down.

IS managers should be more managers than technicians and were asked to make the transition from functional manager to general business manager. Since managing IS was considered much more than a technical issue, ways to align IS with organisational strategy were needed. Steering committees were created to solve this. The PC caused a series of innovation in user interface design that raised the standards of a friendly application. End user computing started to be viewed as an organisational issue and not only as a technical one.

- The network era (1985-):
  This era is characterised by IT-usage not only incorporating data- and information-management but also communication and interaction. EDI, Internet and virtual organisations are examples of constellations that have grown out of this era. At the same time traditionally separated areas such as IT-usage and technical IT are being increasingly integrated. In the network era discussions are concerned with how IT can help businesses rather than organisations to develop and change. The cost of IT is more relevant than ever before since the prime issue for many companies in this era is to cut costs to survive. IT-managers must be able to handle a broad spectrum of questions in co-operation with an increasing amount of interested parties.

  The role of IS in competitive strategy and in the value chain started to grow in popularity. Clear competitive gains from IS could be seen in industries such as airline and finance. Information systems were starting to be viewed as a strategic tool. IS also had a role in organisational downsizing targeted on cutting overhead and regaining competitiveness. Organisations were flattened. LAN's that focused on economies to be gained from sharing expensive hardware were installed, minimising fees for software licences and as a way of sharing databases.

Leading executives had become more of an active participant in corporate strategy and external affairs. Many IS managers came from a hybrid background which included both business and technology. Two-way communication between CEO and IS executives intensified. Flatter, team-based, customer driven organisations focusing on business processes and communications with suppliers and customers evolved. Databases contained extensive information about buyers and were seen as a new corporate asset. Client/server computing architectures was a major influence. Companies were buying packages and external contractors to reduce fixed costs and to improve learning which lead to shrinking central IS organisations.

6.2.1 EVOLUTION OF IT-MANAGEMENT THINKING

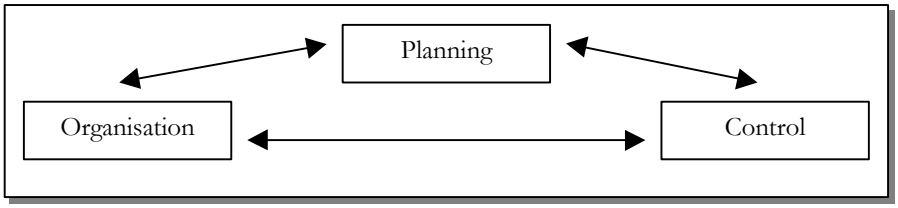

Figure 6: from Earl, 1989

Figure 6 is a categorisation that was used by Earl (1989). It is a way of categorising IT-management issues and was the dominant one at the end of the 80's. By looking at the categorising of IT-management performed by Galliers (1998) it is possible to see how thoughts within the area have changed (figure 7). While control and planning in the 80´s was dominant now other issues like cognitive psychology and organisational behaviour is considered more important.

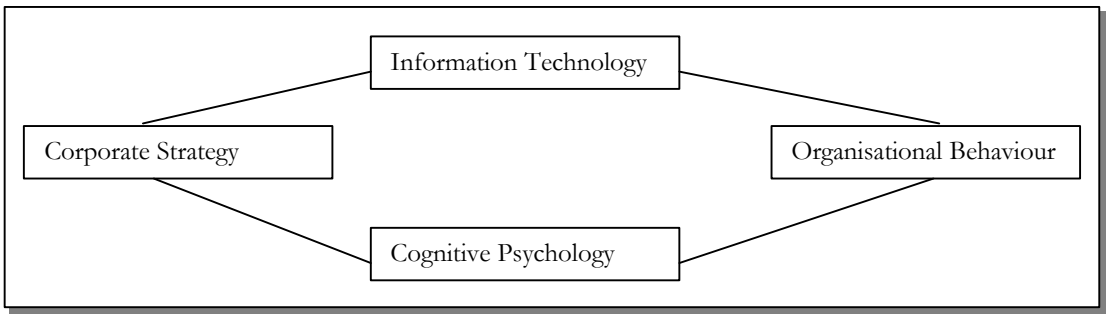

Figure 7: A circle of forces for the consideration of IT and organisational transformation (from Galliers, 1998)

7 STRATEGY

Defining strategy is a hard task. The word has been used in a lot of different ways and contexts throughout history. To be able to give an account of the "correct" definition of strategy is probably impossible. There are too many different meanings to the word and thus there is no such thing as the correct definition of the word. We will try to give an account of existing thoughts on the subject.

7.1 WHAT IS STRATEGY?

Strategy derives from the Greek word "strategos" – "the art of the general". Strategy has to do with the practical adaptation of the means placed at a general's disposal to the attainment of the object in view (Noorderhaven, 1995). In Encyclopædia Britannica this explanation of the word is given: "in warfare, the science or art of employing all the military, economic, political, and other resources of a nation to achieve the objects of war."

As stated before the word strategy is widely used. Existing literature offers several different definitions of organisational strategy and two of these will be cited.

> *"Strategy is the pattern of resource allocation decisions made throughout an organisation. These encapsulates both desired goals and beliefs about what are acceptable and, most critically, unacceptable means for achieving them." (Robson, 1997)*

> *"The essence of strategy is for a firm to achieve a long-term sustainable advantage over its competitors in every business in which it participates. A firm's strategic management has, as its ultimate objective, the development of its corporate values, managerial capabilities, organisational responsibilities, and operational decision making, at all hierarchical levels and across all business and functional lines of authority." (Hax, 1987)*

In other terms strategy can be defined as the way to reach the goals of the organisation. To formulate a strategy is to decide which goals the company should have and how recourses should be deployed to reach those goals.

> *"A Company can outperform rivals only if it can establish a difference that it can preserve. It must deliver greater value to customers or create comparable value at lower cost, or do both. The arithmetic of superior profitability then follows: delivering greater value allows a company to charge higher average unit prices; greater efficiency results in lower average unit costs." (Porter, 1996)*

It is important to realise that there is a difference between operational effectiveness and strategy. After a decade of huge gains of operational effectiveness companies are now seeing diminishing returns. The pressures of continuous competition have made companies behave in almost identical ways. Phenomenon like best practices have made companies perform better, but it also means that they are almost homogenous. Operational effectiveness has been favoured on behalf of strategy, which has lead companies into a zero-sum game with static or declining prices affecting their ability for long term investments.

"Competitive strategy is about being different. It means deliberately choosing a different set of activities to deliver a unique mix of value." (Porter, 1996)

Strategy is all about performing activities in different ways or to perform different activities than competitors.

"Strategy is the creation of a unique and valuable position, involving a different set of activities." (Porter, 1996)

To make it possible to choose a unique position is not enough. Rivals will soon try to imitate an organisation with a successful strategy. Competitors might reposition themselves to match the performance of a successful organisation by straddling. Straddling means that a competitor tries to match the perceived benefits from another organisation while maintaining its existing position. The company uses new features, services or technologies on to the activities that it already performs. A strategic position is not sustainable unless there are trade-off with other positions. Trade-off occurs when activities are incompatible and it can arise for three reasons. First: from inconsistencies in image or reputation. Second trade-off arises from activities themselves. This requires for example different skills and different management systems. Third: when a company clearly focuses upon a special way of competing it makes organisational priorities clear. As managers have improved operational effectiveness they have tried to eliminate trade-off but without trade-off companies will never achieve a sustainable advantage. The essence of strategy is choosing what not to do. If there were no trade-off no choices had to be made and therefore no need for a strategy. Ideas could be rapidly copied and put into practice.

7.1.1 INTENDED AND UNINTENDED STRATEGIES

Strategy should function as the pointer that leads the way in high impact decisions as in small everyday decisions that organisational members are confronted with (Porter, 1996).

Strategy and goals have to be successfully communicated and accepted by organisational members if they are to have intended effect. As a consequence this leads to the fact that "what an organisation does often have little to do with its official strategy" (Mintzberg and Waters, 1985). A decision, taken by an organisational member or a group of members, that is not aligned with the intended strategy leads to a new unintended strategy. At least unintended by top management but not by the organisational members (Noorderhaven, 1995).

7.1.2 STRATEGIC MANAGEMENT

The strategic side of management seeks to create a prerequisite or scenario about the social realities future. Bunge express it in the following way (Magoulas, 1997):

"The future belongs to them who designs and builds it rather then to them who wait for it"

The main purpose with strategic management is to form a social associated understanding about change direction and change effects. The result constitutes a common policy and a strategy for all concerned parties.

7.2 HISTORICAL DEVELOPMENT OF STRATEGIC THINKING

When companies stagnate and end up in crisis it almost always depends upon the fact that management has not been able to transform the company to perform in a way that meets changing business needs. Strategic problems that management face, have become more severe because the speed of change has intensified. The consequences of these changes have also become harder to predict (Alarik, 1998).

Management has two main tasks, one is operational, and the other strategic. Operational control is developed but in many companies strategy is underdeveloped. In the future management needs to master both operational and strategic thinking. The problem is that it takes a totally different way of thinking when dealing with long term development. Operational control deals with problem solving, as for example, costs and productivity increases.

Strategic thinking, as opposed to operational control, is creative thinking and it deals with creating opportunities and developing ideas. This includes a consciousness about the development in the environment, which is a basic building block in strategic thinking. It is important to identify threats and possibilities at an early stage, with long time perspectives, looking further than everyday problems, in order to work towards long-range goals and objectives. Business has to be in focus.

A management dilemma is that methods that are well suited for operational control is not well suited to handle the long term development of an organisation. A basic difference is that operations put great emphasis on stability with the focus on efficiency, which means: "do things in the right way". Flexibility on the other hand is a ground rule for long range development and it therefore has its focus on effectiveness: "do the right things".

According to Alarik (1998) strategic thinking has to be a part of all levels of management. Top management rarely has the capacity and competence to control all development in detail. They need to delegate to lower levels of management. But this is not enough. Strategic thinking needs to be an important part at all levels of the company. Otherwise individuals at other levels within the company will resist change. This is even more important if great emphasis is put on flexibility.

Management by giving orders is not a good way of conducting business anymore, says Alarik (1998). Instead, management trough common goals and objectives is a way of running

the business. If people know in what direction the company is heading, people need fewer orders, and strategies might be implemented in a better way. This does not only concern a few heavy impact decisions, but also every little decision that has to be taken within the company.

7.2.1 FROM LONG RANGE PLANNING TO STRATEGIC PLANNING

The first long-range instrument for strategic planning was developed in the US during the 50's (Alarik, 1998). Before that, there was no need for long range planning since almost all businesses were stable and changes were predictable. One could trust operational tools such as cost accounting, budget and eventually "management by objectives".

As an answer to the growing economy after the war companies started to plan ahead. One-year budgets were not enough to plan the increases in capacity needed. Plans having longer range were necessary. When long range planning was introduced it was an answer to the need of a better tool predicting what was going to happen in the booming times of World War II. One-year budgets were not enough to meet the raises in capacities that were needed to meet the growing demand. As a result five-year plans were instigated in Swedish companies. During the 60's long time planning became common in Swedish companies. These were plans that had a scope of five or more years into the future. Long range planning is based on prognoses of future sales for the company. The prognosis was done by extrapolation with historical data. With base in the prognosis of sales plans were made for different functions of the company, marketing, production etc.

Long range planning with extrapolation can be used as long as market growth is stable, development somewhat predictable, and competition relatively weak, as many of the industries were during the 50's and 60's. Long range planning can be a useful tool that can handle variations in the business cycle if there is growth in the long run, i.e. recession has to be followed by a boom that is on a higher level than earlier booms. When the environment gets more turbulent, the weakness of traditional long range planning becomes obvious. With the oil crises of the 70's the environment started to change in a faster and more unpredictable way. This came as a surprise to society, and industry after industry was faced with a loss in demand, excess capacity and tough competition. Many companies understood that long range planning was not flexible, and instead of making adaptation easier, long range planning was a contributing factor to tie companies closer to an old structure and objective. As a result, companies went from long range planning to strategic planning. In some cases this was just a question of changing the sign on the door from long range planning to strategic planning, while other companies changed the view of planning completely.

The main differences between long range planning and strategic planning lies in how the future is looked upon. Long range planing says that the future can be predicted trough extrapolation of historical data. Strategic planning assumes that there will be significant changes in development and trends that will force the company to change its structure.

One of the most important factors of strategic planning is environmental industry analysis. Its purpose is as soon as possible to, discover trends and changes in the environment that will affect the business. This way strategic planning contributes to a better way of facing the future.

Strategic planning was fashion in Sweden until the end of the 70's and in the US until the middle of the 80's. After this date, strategic planning faced great resistance. The plans did not live up to top management's expectations. They were often big paper products that were not executable or up to date, and the people that had to execute the plans looked at them as only paper products. Another common mistake was that companies in the spirit of long range planning based their plans on predictions that went wrong.

Strategic planning was often a task that was very demanding. It required a great deal of data collection at many levels, which was viewed as unnecessary pushing of paper and bureaucracy. There was a strong feeling about what could be achieved with strategic planning which took the upper hand on intuition, knowledge of industry and business. The development of the business became a question of the planning function.

8 INFORMATION TECHNOLOGY AND CHANGE

Managing change is one of the most difficult challenges that business organisations and IT-managers face today. Change management is defined as the continuous process of aligning an organisation with its marketplace and doing it more responsively and effectively than competitors (Kudray and Kleiner, 1997). Managing change includes identifying the destabilising forces, determining your alignment in the market, electing the appropriate methods to use, creating the most effective change strategy, and applying them with the most accurate manoeuvres.

8.1 EMPLOYEES VIEW ON IT AND CHANGE

As the pace of technological change accelerates, workers are expected to learn new IT applications and be willing to change their work procedures. Unlike managers and IT specialists (who naturally support the systems they buy) their reactions to new technology vary greatly; although in some cases enthusiastic, in others poor communication, organisational power shifts or other factors can lead to hostility or apathy. Fortunately, says Lynne Markus (1999) negative reactions usually diminish, as people become accustomed to new systems and glitches are ironed out. But many people simply "get by" with IT applications and are far from using them with maximum effectiveness. Many companies fail to push for continuous improvement and do not prioritise training. Another issue is the rise of standardised enterprise resource planning packages, which may pre-empt more work for some employees in spite of overall benefits.

People who make decisions about adopting new technologies or about new changes are usually line managers and executives. Vendors and the media influence them and they may have unrealistic expectations assuming that new technology or change is the magic bullet that can cure the organisation. Technology specialists too are often enthusiastic about new technologies, not only because they like technology but also considering that the success of their careers may depend upon knowing about the latest developments. The most varied reactions to new information systems and technologies come from those who are expected to use them. Here reactions range from full enthusiasm to pure hostility.

Explanations to the reactions of technology users are as varied as the reactions themselves. It is a common claim that resistance to change is a fundamental human trait. A

second explanation focuses on the process of making the change: whether people have had a saying in selecting the technology or in the way it is introduced and used. A third account centres on the technology itself: how well suited it is to users work, how easy it is to learn and use, how forgiving it is to user errors and so forth. Yet another explanation focuses on group and organisational dynamics: the perceived or actual effect of the technology on social relations, the distribution of power and on existing job skills.

New technologies often accompany other organisational changes, such as changes in job design or conditions of work. It can be difficult to distinguish people's reactions to other changes. New technology is a convenient scapegoat for many workplace dissatisfactions. Clearly, any or all of these factors may play a role in how people react to new technology and change. There are some interesting aspects of such workplace reactions. People's initial reactions to new technologies do not always last. Negative reactions due to fear and uncertainty often evaporate after experience with the technology. In the beginning there are usually problems with downtime, conversion errors and mistakes by novice users. When these initial problems are resolved people tend to become more accepting.

In many business organisations today, making people change is still the greatest obstacle to progress. The first step towards change is a tough one for everyone. But the big challenge is often to get executives to understand that leaders must become learners too, otherwise the whole initiative will fail due to lack of support when things get tough. Middle managers often face the most difficult dilemma. They are caught in the middle among individuals who are not sure why, in the first place changes should take place and top managers who think they themselves do not need to change even if everyone else does. (Sometimes even the managers are not sure why change is necessary). Drivers of change watch this whole drama unfold, perplexed by the fact that none of these groups understand anything nearly as well as they do.

The key proposition is that it is possible to maintain both the perspective of the employee who is attempting to use the organisation to fulfil his or her individual needs and at the same time fulfilling organisational needs. It is argued that the only way to achieve long-term effectiveness is by maintaining the appropriate balance between organisational and individual goals. Therefore it is necessary to understand what makes people do what they do and pursue the goals they pursue. If the organisation expect people to be committed to its goals it must provide rewards and conditions consistent with this level of involvement. This does not necessarily mean a larger paycheque. Other factors should instead be in focus, as for example a sense of belonging, creativity and the opportunity to grow. The theory states that motivation is a combination of the individual's perception that effort will lead to performance and that performance will lead to desirable outcomes. A high level of satisfaction is reached when employees see their work as meaningful, worthwhile or important and when the employees feel personally responsible and accountable for his or her efforts. The employee must also receive regular and reliable feedback on performance (Brancheau and Hoffman, 1987).

It seems impossible for management theorists to cope with the multivariate nature and messiness of human organisations in a cultural context (Galliers, 1998). Management is getting more unpredictable and this changes the nature of planning and the way these plans are implemented. Organisational direction is a trend that is drawn from a number of

individuals and their actions and interactions with each other. An organisation that is messy from the beginning will become even more so when it is an electronically networked organisation. This is something that affects IT-management in large and will do so even more in the future when organisations change their way of conducting everyday business. Organisational learning, structural premise and power are critical factors that will influence the changes in IT and emergent organisational forms (Galliers, 1998).

8.1.1 PSYCHOLOGICAL CONTRACTS

Psychological contracts are unwritten agreements operating between workers and managers (Brancheau and Hoffman, 1987). The contract is made up of the expectations of each of the parties. They involve the individuals sense of dignity and worth, demanding to be treated by organisations as a human being that wants to grow and learn, and who needs feedback on performance. On the other side of the contract, managers expect their employees to enhance the image of the organisation, to be loyal and to do their best. Over time the contract constantly has to be renegotiated since the needs of both organisation and employee changes. Since environment changes rapidly it requires highly motivated employees who have the desire and the ability to do their job. Successful adaptation requires an internal climate of support and freedom from threat. The organisation has to go trough constant redesign to meet goals.

Birchall and Lyons (1995) describe quite a few companies as being tactile based on the behaviour of the individual who experiences the world through feelings. Tactile companies experience occurring opportunities as having to be carefully evaluated before acted upon and any difference between theoretical supposition and hard facts must be totally eliminated. There must be no doubt. This can only be reached trough first-hand direct and totally unambiguous experience. The tactile company can be seen as paralysed and never acts before it suffers. It will never be a leader and will therefore never really prosper. They play the game of the "first-move" strategy that is they await the first move of others. Once the strategic leader or a company with a certain reputation seem to be reaping significant business benefit from the change others will follow.

8.1.2 RESISTANCE

The most common reason to neglect the existence of a problem ought to be the fact that people want to maintain a social acceptable facade (Watzlawick, 1996). This often gives public secrets, everybody knows about the problem but if nobody talks about it, the problem will go away. People acts as if no trouble exists and that is a terrible simplifying thing to do. If introducing change sounds like a difficult and trying process, it is. Many writers point at two levels of resistance (Mariotti, 1998):

- Level 1 resistance is based on lack of information or on honest disagreement over the facts. Everything is on the table; there are no hidden agendas fuelling the resistance.
- Level 2 is personal and emotional resistance. People are afraid. They fear that the change may cost them their jobs, reduce their control, or cause them to lose face.

Resistance is often treated as if it was Level 1 resistance and consequently misses the mark in change efforts. For example, slick visual presentations are used to explain the

change with nice neat facts, charts, and time lines, when what people really want to hear is: "What does this mean to me?" Level 2 issues can be addressed only through conversation and conflict. Slick presentations are not enough.

9 CLASSIFICATION THEORIES

In order to analyse our findings the following theories will be used.

9.1 ARCHITECTURE

The architectural concept reflects a practically and socially organised human reality (Magoulas, 1997). IT management deals with co-ordination of beliefs of how technology is going to be used to improve organisational and social reality. This co-ordination is expressed in an **ends and means architecture,** which describes a basic belief in the direction and on the content of the information environment, and comprise an articulated and accepted idea of development (Magoulas and Pessi, 1998). IT-management can among other things be derived from the interrelationship between ends and means (root architecture) as well as the interrelationship between the whole and the parts (macro architecture).

Root architecture is the relationship between ends and means making meaningful activity and performance of the organisation. It links the goals of the social reality with its systems images.

IS architecture is the combined overall structure of all information systems. It is a system design that covers the main business transactions, relevant information, flows of information between system borders, and planned or suggested implementation (Ben-Nathan, 1980). IS architecture is supposed to guide the long-term development but also permit the short-term reaction (Wetherbe, 1988). IS architecture is made up out of the mass of principle and rules that control an organisations present and coming arrangements of computers, data, human resources, communication, software and relationships of power (Allen & Boynton, 1991).

Meta Architecture is a conceptual level and it defines the terms that provides a language, which enables different individuals to communicate about critical issues in the environment and also give a picture of the company vision of an ideal information system environment (Hoffman, 1988). Meta architecture deals with the philosophical grounds behind design, redesign and management of the conceptual model and hence the whole information system. These rules steer the specification and modification of the concept base and the rule base, which are the grounds to communicate with the surroundings of the system.

Social Architecture is a way to interpret relations among individuals. To reach success with information technology it is important to understand these relationships (Magoulas and Pessi, 1998). The social architecture is not only the ground for social togetherness but also to social conflicts. People are different and the social architecture takes its standpoint in these differences. Differences can originate in functional differences i.e. competence and knowledge of the trade. Infological differences i.e. cultural differences in the form of

language, value and feeling etc. Structural differences i.e. differences in social interests such as power, responsibility and resources. Philosophical differences i.e. differences in perspective on functional, infological and structural differences. The contents in a social architecture are humans and artefacts.

Makro Architecture is the established mutual links between the social architecture and the IS architecture, these links can be analysed in terms of

- Functional architecture – process and IT systems
- Structural architecture – power and IT systems
- Infological architecture – world images and IT systems

9.2 CRITICAL SUCCESS FACTORS

The analysis of critical success factors (CSF) is a concept developed by Rockart in 1979 as a way of assisting managers to handle technical matters, and to define their significant information needs (Robson, 1997).

O'Brien has presented the CSF as a method for guidance of policy decisions (Magoulas, 1997). A few areas that are critical constitute critical success factors in an organisation where the results have to be positive. This is necessary for the survival of the organisation in a dynamic, heterogeneous and in many cases hostile surrounding. For the business this means that every individual success factor must be guarded constantly and that actions must be taken immediately when something goes awry. Since business changes constantly there is a demand for a regular revaluation of the success factors

The CSF method usually involves two basic steps: interview the manager, and review the results. Questionnaires may also assist the data collection effort. To assess the usefulness and availability of critical information the CSF method has been used to evaluate information provided by MIS (Management Information System) to the information needs of management.

CSF is a tool that highlights and identifies the conditions that must be fulfilled to succeed.

> *Critical success factors are those handful of things that within someone's job must go right for the organisation to flourish (Robson, 1997)*

It is important to notify that there are only a few critical success factors. If too many factors can be identified they are not critical.

9.3 SWOT

SWOT is the acronym for a company's strengths, weaknesses, opportunities, and threats (Kotler and Armstrong, 1996). A SWOT analysis evaluates a company's internal strengths and weaknesses and its external opportunities and threats. It is a valuable strategic planning tool, because it focuses on the key elements of a company's position within a market. The following are definitions of the four components of the SWOT analysis:

Strength - something a company is doing right or is good at. It may be a skill, a competence, or a competitive advantage that the firm has over other rivals.

Weakness - something a company lacks or does poorly as compared to rivals or a condition that puts it at a disadvantage.

Opportunity - a realistic avenue for future growth where a company has the most potential to develop a competitive advantage

Threat - an external environmental factor that can lead to a decline in a company's future performance. Threats can stem from the emergence of cheaper technologies, rivals' introduction of new or better products, entry of low-cost foreign competitors, new burdensome regulations, unfavourable demographic shifts, political changes, etc.

Conducting a SWOT analysis is like setting up a strategic balance sheet where strengths can be thought of as competitive, assets and weaknesses, as competitive liabilities, and where opportunities and threats are future assets or liabilities, respectively.

PART IV: ANALYSIS

10 EARLIER STUDIES

In this section we present earlier studies that have been conducted within the IT-management area both in Sweden and in other countries. A brief explanation of the issues presented can be found in the Appendix.

10.1 RESEARCH ON KEY ISSUES WITHIN THE IT-MANAGEMENT AREA

As part of our research we have studied earlier surveys and research conducted within the IT-management area. The studies we present have tried to pinpoint issues considered important by actors in companies and government as well as within the field of research. These surveys include research done in Sweden, Taiwan, Hong-Kong and the US.

10.1.1 TRENDS

The SIM[5] studies give us the possibility to get a picture of the issues that have been considered important over time and how these issues have changed. The SIM studies are positioned somewhere in between the academic world and the practical world of business. The studies give a good view on these issues and how they have evolved. Since the studies have been performed in somewhat identical ways, the results can be more easily interpreted. All the studies except the one performed in 1980 were performed in a similar way (Delphi method), trends can therefore be interpreted in the same way.

[5]The Society for Information Management (SIM) has during the last fifteen years periodically studied the most critical issues in IT-management. SIM is an organisation that has as members' senior executives who are corporate and divisional heads of information technology organisations and their management staff, as well as other leaders in education and consulting who influence the management and use of IT in a wide variety of organisations. The members are exclusively based in the US and the majority comes from the commercial sectors of manufacturing and services (85%) with the rest employed within government or education. This research has been done trough surveys with its members and has investigated key problems facing IS managers in organisations. Every study tries to map the issues that the respondents think will be critical in three to five years from the year when the study is made. The respondents are thus asked to answer what they think will be the most critical IT-management issue in three to five years. This implies that the study performed in 1994-95 points at critical sucess factors in 1997-2000.

Table 2: The SIM studies

Issue	Rank				
	1980[6]	1983[7]	1986[8]	1989-90[9]	1994-95[10]
Business Process Redesign	-	-	-	-	2
Collaborative Support Systems	-	-	-	-	11A
Communication Networks	3	13	11	10	5
Competitive Advantage	-	-	2	8	17
Computer Aided Software Engineering	-	-	-	12	-
Data Resource	4	9	7	2	7
Decision Support Systems	5	10	-	17	-
Disaster recovery	-	-	-	20	-
Distributed systems	-	-	-	12	3
Electronic Data Interchange	-	-	14	14	19
End-User Computing	10	2	6	18	16
Information Architecture	-	-	8	1	4
IS Effectiveness	2	5	9	16	11B
IS Human Recourses	7	8	12	4	8
IT and business alignment	9	7	5	7	9
IS Role & Contribution	-	15	4	11	13
Legacy Applications	-	10	15	16	15
Office Automation	6	12	-	-	-
Organisational Learning	8	6	3	5	14
Outsourcing	-	-	-	-	20
Planning and Integrating MultiVendor Open Systems	-	-	14	12	18
Responsive IT Infrastructure	-	-	-	6	1
Data security	11	14	18	19	-
Software development quality	13	4	13	9	6
Strategic Planning	1	1	1	3	10
Technology Integration	-	3	10	-	-

- Indicates that the issue was not ranked among the top 20 in importance.

[6] Ball et al. 1982
[7] Dickson et al. 1984
[8] Brancheu & Wetherbe 1987
[9] Niederman et al. 1991
[10] Brancheau et al. 1996

10.1.2 STUDIES PERFORMED IN ASIA

In 1996 two surveys were performed in Asia, one in Taiwan and the other in Hong Kong. In those countries companies were surveyed to identify key issues confronting managers and developers of IS at present time and five years ahead.

Table 3: Comparison of IT-management issues in Taiwan and Hong Kong

Issues	Taiwan[11]	Hong Kong[12]
Top management support	1	-
Communication with end users	2	15
Goal alignment	3	-
Competitive advantage	4	5
Strategic planning	5	3
Data security	6	9
IT and business alignment	7	10
Data resources	8	2
Technology integration	9	20
Database management systems	10	-
Information architecture	11	4
Software development quality	12	1
IS Human resources	13	7
User friendliness of IS	14	-
Decision support systems	15	17
Preventing viruses	15	-
Office automation	17	-
Evaluating IS organisational impact	18	13
Telecommunication systems	19	11
Computerisation of routine works	20	-
IS effectiveness	-	6
Organisational learning	-	8
Disaster recovery	-	12
Applications portfolio	-	14
Responsive IT infrastructure	-	16
Distributed systems	-	18
CASE	-	19

10.1.3 SUCCESSFUL WAYS OF HANDLING INFORMATION TECHNOLOGY

To utilise IT as a strategic tool, Anderson and Cinander (1993) present the important issues they found when studying the Swedish municipality function (the factors are summarised in table 4). The study performed by Anderson and Cinander is mainly written for the Swedish municipality function but we find that the factors presented can be applied on other businesses as well. The authors have a genuine background as consultants in the private sector basing their study on own experiences.

[11] Yang H.-L. 1996
[12] Moores, T.T. 1996

Information technology in a company can not live its own life, holistic views must dominate the way organisational member's prospect IT. Information technology is a tool that should support the administrative and organisational processes of a company to make the organisation more efficient (Anderson and Cinander, 1993).

Table 4 Summary of success factors

Success factors found in the study (1993)
1. Create a work-process for the IT-function
2. Adapt a holistic viewpoint
3. IS Role and contribution
4. Core competence
5. IS Effectiveness
6. Responsive IT Infrastructure
7. Competitive advantage
8. Strategic planning
9. Organisational learning

10.1.4 NORDIC IT-MANAGERS TAKE A SIGNIFICANT PART IN DEFINING BUSINESS STRATEGY

According to a recent survey performed by Compass in collaboration with London School of Economics (Byttner, 1999) Nordic IT-managers take a significant part in defining business strategy. 55 percent take significant part in this work while the same figure outside the Nordic countries is a bit lower, only 47%. This is interpreted by researchers as if the Nordic countries have a higher IT maturity. According to the article top management that have the most positive attitude towards IT are the ones that are most willing to let IT-managers participate when defining new strategies.

The survey also shows that Nordic IT-managers, to a higher extent than its colleagues, make IT influence business processes. Organisation's in Nordic countries have a high degree of balance between plan and outcome in IT projects. In other countries then the Nordic, chief executives claim that IT has small influence on business.

10.1.5 SWEDISH COMPANIES KEEP THE IT-LEAD

The statement that Swedish companies have a high level of maturity, at least compared to other European countries is supported by another survey, conducted by Grant Thornton Management Consulting (Wallström, 1999). This survey shows that the share of Swedish companies that have their own homepage, use e-mail and Internet is much higher than the European average. These findings were reported in a recent study that was based on interviews with 7500 small and middle-sized companies. The report shows that Swedish companies do not experience a scarcity of educated labour, investments in equipment and technology are high, and Swedish companies are more optimistic towards change than companies in other European countries. On the other hand Swedish companies see limitations due to government rules such as high taxes.

11 EMPIRICAL STUDIES

This section present findings from our empirical study. A brief explanation of the issues presented can be found in the Appendix.

11.1 EMPIRICAL FINDINGS

Our interviews identify issues that the respondents found important in IT-management. The results represent the collection of thoughts that we discussed during the interviews. The following statements represent issues that the respondents found important (table 5). We have not ranked these issues since it was very difficult for the respondent to rank them. The respondents are managers and IT-managers from four different organisations. Their answers were surprisingly similar even though their organisations operate in different industries and are of different sizes.

Table 5: Empirical Findings

Issues
IT and business alignment
Improvement of social contracts
Cognitive conformity
IT people support users
Understanding/Adapting ideas
Social networks
Human resource management
Knowledge management
Fast communication
Common IS architecture
Internet strategy
Common user interface
Standardisation
Balance between central guidelines and local responsibility
The right people in the right place
Linking regional areas/co-ordinate (linking people)
Outsourcing
Standard application systems
Power of IT suppliers
Competence of IT suppliers

The empirical findings show that the issues considered important are mainly meta architectural. Respondents gave priorities to questions such as communication, policies and guidelines since they seek standards that will make IT more cost effective and adaptable to changes. All the interviewed IT-managers stated that media and colleagues more or less influence them in their way of thinking. Some of the issues are just buzzwords that are popular at the moment, they will probably change over time, while others will surface. IT-managers were willing to admit that Swedish companies easily adapt US trends, and that they

have a tendency to look at others before taking measures in other directions to be reassured that they do the right thing.

The empirical findings show that issues from all areas in "How we view the world" (figure 2) are represented in the model (figure 8). Focus lies on internal issues and the interrelation with the environment seems to be working in a non-perfect way

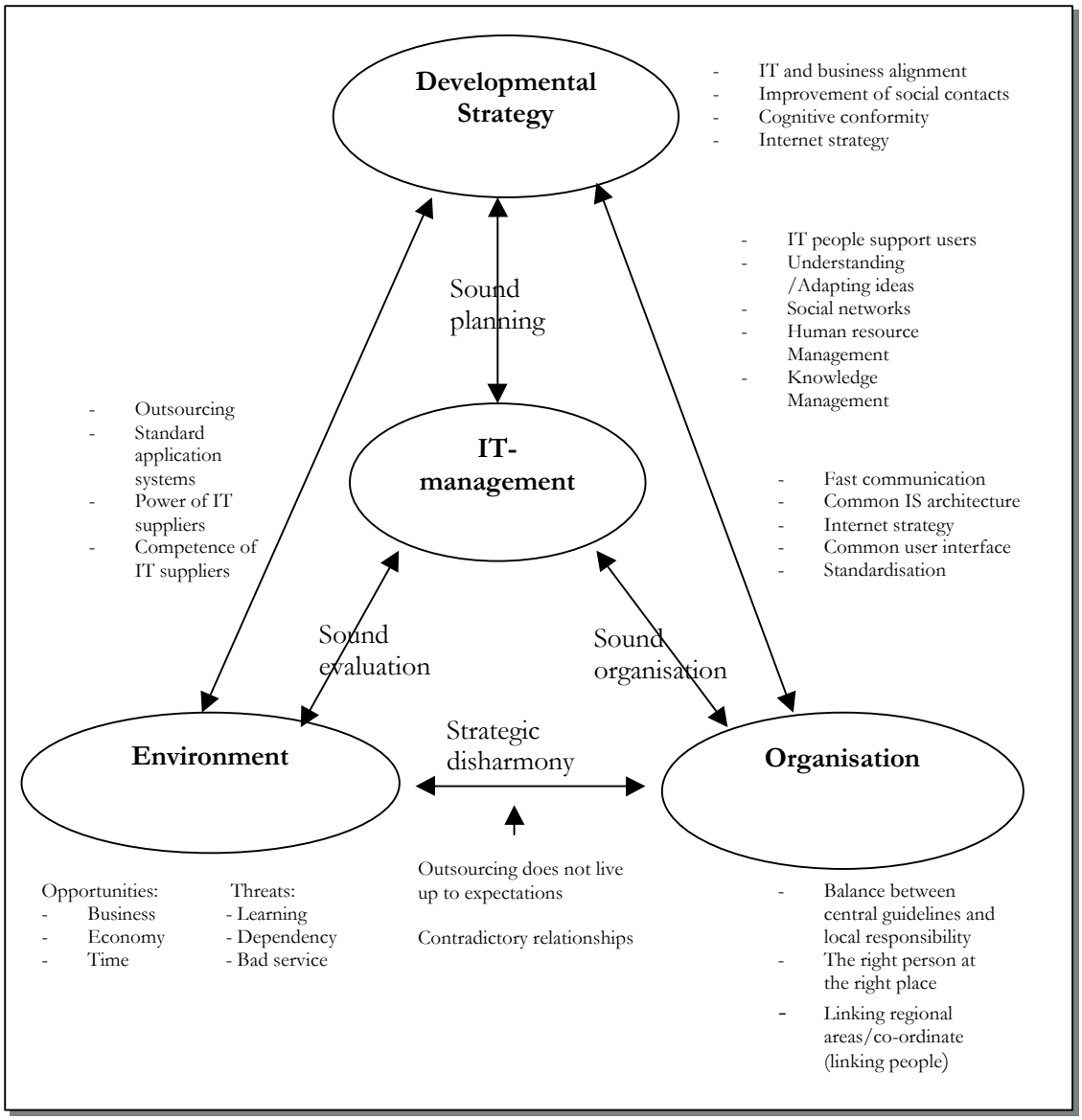

Figure 8: Model of empirical findings

Even though the answers in this study to a high degree coincide with earlier studies, some new issues have surfaced. From our interviews we can conclude that IT-mangers support end users and feel that their involvement is an important issue.

"IT should be used as a tool in the work process and it should be developed at operational level were it is used. There should only be one common user interface for all functions. This will make it easier for people to use computers." (IT- co-ordinator, Company A)

However this is not always possible to achieve since a total democracy is contstrained by different opinions, cost and time.

"You have to be realistic, democracy does not really exist in a company. Users can not be involved all the time." (IT-controller, Company C)

"End users are involved trough their managers. They have to look after the needs of users. Otherwise there will be a thousand different opinions and demands without relevance. Someone with a good overview has to decide what is and what is not relevant." (IT-manager, Company D)

Several of the respondents discussed e-commerce, which today is an integral part in their daily work.

"Internet is one of the most important factors of the future. Internet interests everybody and it spreads constantly."(IT-controller, Company B)

"E-commerce is a strategic issue. Since everyone has to change to new ways of working it is vital that there is a great deal of co-operation. People that do not feel that E-commerce will affect their way of doing business will have to change their behaviour."(IT-controller, Company A)

Outsourcing, partly or totally is also a highly prioritised area. Company *A* decided five years ago to outsource their IT support and this has not been a totally successful agreement. There is a widespread opinion that the competence of some of the consultants from the outsourcing company could be better and company *A* has lost some of their personnel to the outsourcing company.

"The competence level of the consultants from our outsourcing partner is very varied. Since it is very expensive to call in the consultants their level of competence has lead to criticism from employees at our company. They have got recruiting problems and therefore we sometimes have to educate their new consultants."(IT- co-ordinator, Company A)

They have felt that the outsourcing company were more competent in the area and thus more powerful when negotiating.

"When the outsourcing deal was closed there was a common feeling that people not belonging to top management would have been fired if they had signed a deal like that. We unprofessionally handled the deal because the people closing the deal were not competent enough to see if the deal was good or not. The outsourcing partner wrote the deal and made a pretty good one. The first year was characterised by a lot of problems and the outsourcing partner was criticised." (Business manager, Company A)

The contract will be negotiated next year and company *A* think that the new deal will work better since their competence in ordering has increased.

"There are no risks in outsourcing as long as business development and IT-management stays within the company and at a high level of competence." (IT-manager, Company A)

"Outsourcing is the right way to go when handling IT." (Business manager, Company A)

12 ANALYSING DATA

In this section we present how collected data is analysed.

12.1 A MODEL FOR UNDERSTANDING CSF IN IT-MANAGEMENT

The model to understand CSF in IT management that we present has grown out of a need to gain clarity and understanding. By classifying the factors found strategic in our study in a way that portrays their interrelationship as well as their relevance in the organisational context, helps us gain clarity and understanding.

Earlier studies within the area have classified their findings into four groups (Brancheau, 1997), (Moores, 1996) and (Yang, 1996):

- technology infrastructure
- business relationship
- internal effectiveness
- technology application

The usual interpretation of technology infrastructure includes issues such as responsive infrastructure, information architecture, communication networks, and distributed systems. Technology infrastructure is focused on the integration of technology components that are needed to support modern business applications and databases. Strategic planning, organisational learning and IS organisation alignment deal with external management concerns, such as relationship between the IS function and the business enterprise, and belongs to the business relationship group. Internal effectiveness are issues that focus internally on planning and control of the IS function and include issues such as IS human recourses, software development, and IS effectiveness measurement. Technology application issues focus on business application of specific classes of information technology and include collaborative support, executive/decision support, and end-user computing.

Brancheau et.al (1997) present trends (figure 9) on how the classification groups described above have changed over time.

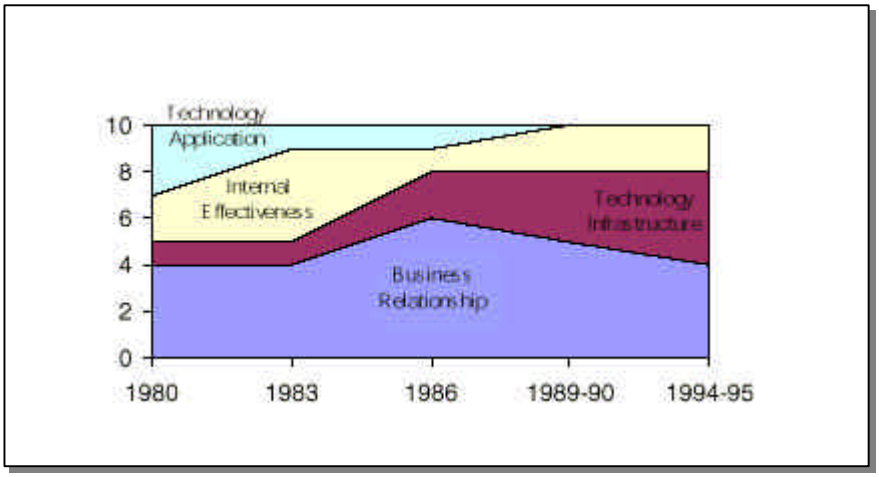

Figure 9: Trends in Key Issues Framework (from Brancheau et al. 1997)

This (figure 9) way of categorising findings does not include human beings and their reaction towards technology or how these issues relate to the environment. In our opinion this way of presenting factors is insufficient to get a clearer and better understanding of CSF in IT-management. As presented earlier an organisation needs employees that are adaptable and motivated if organisational goals are to be reached. When focusing on the issues presented above this aspect is lost. This way of presenting the issues does not make IT-management any clearer and does not help us in our quest to find a way of understanding the interrelationship among factors. We feel that it is of importance to understand the whole, which includes factors such as the social and organisational reality.

To reach clarity and understanding we have tried to combine different factors into a whole to see how they are related to each other. We categorised these factors in a way that makes it possible for us to see the relationships that are vital in IT-management. By doing this we can see where these issues are focused, how they match one another and perhaps which areas that deserve more attention (see figure 10). Note that our model has been developed through the classification of important issues in IT-management that has been published. In this sense the model may be seen as a part of our results.

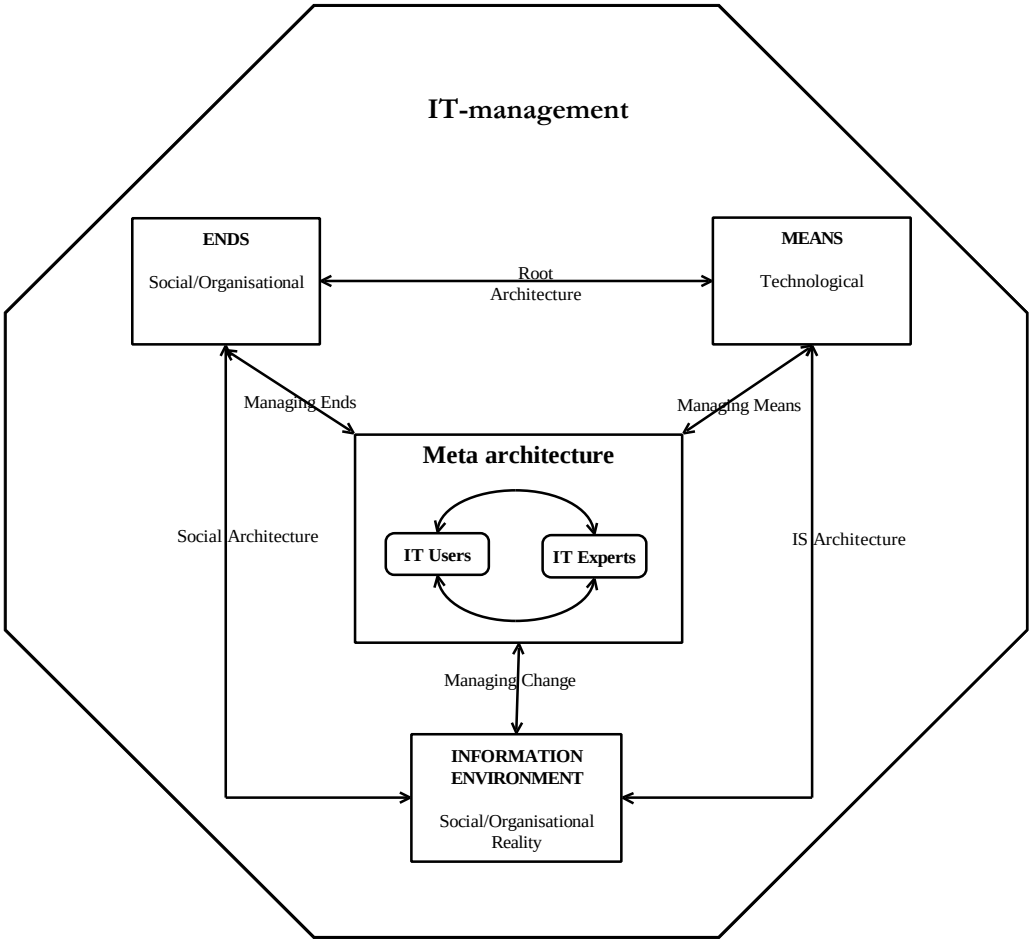

Figure 10: Model for understanding CSF in IT-management

Social/Organisational Ends: As presented in the theoretical framework the root architecture describes the relationship between ends and means of an organisation. Ends are what an organisation want to achieve, its goals, and also what drives an organisation forward. However the organisational members have their own individual goals and it is important to get these goals as closely matched to organisational goals as possible which implies that organisational goals have to be matched to individual goals. Furthermore social and organisational ends are dependent on the organisational environment, the means and the meta architecture. Social/Organisational ends are those issues that are important for the long time survival of the organisation.

Technological Means: are mainly related to technological issues and are the tools of the organisation to fulfil its ends.

Meta-architecture: is a conceptual level and gives a language in which different actors can communicate. Without effective communication there is no way to reach common awareness. In this sense specifically the communication between users and IT experts.

IT Experts: specifically focus on issues that concern IT-experts. IT experts are either internal within the company or external consultants. The external consultants can be a part of an outsourcing deal or hired for some specific task.

IT-users: are users within the business environment.

Social Environment: is the reality that an organisation operates within.

12.2 THE SWOT MATRIX

The chosen model of analysis (see figure 11) use a classification that has similarities with the SWOT analysis and it uses the same terminology but instead of a list it is formed as a matrix (Weihrich, 1990). We believe this way of displaying factors give a good overview and a clearer understanding of how closely interrelated some of the factors are. The IT organisation can only influence events that take place within their control; these factors are thus manageable. Organisational environment is beyond direct management control, which makes the environment less manageable. Factors that are considered as opportunities should be taken advantage of especially if they match strengths. If a factor is considered a threat, measures should be taken to avoid or reduce its negative impact on the organisation.

This matrix will be used to classify the proposed factors for successful IT-management that we have found. They are divided into manageable and unmanageable factors. This model helps us get a better understanding of the CSF of IT-management and their relationship.

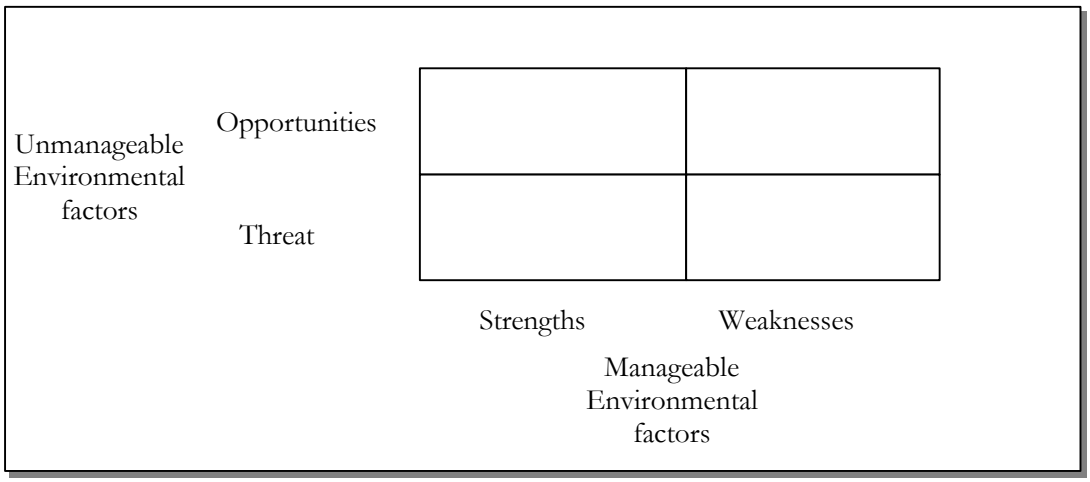

Figure 11: Model of analysis (from Weihrich, 1990)

PART V: RESULTS

13 CLASSIFICATION

In this section we present the results of our findings, they will be classified accordingly in Swedish and non-Swedish studies and over time.

13.1 HISTORICAL TRENDS CATEGORISED ACCORDING TO OUR MODEL

To plot the development over time we use the SIM study since it has been conducted in the same way over the years.

Table 6: Historical trends

Area	Issues	1980	1983	1986	1989-90	1994-95
ENDS	Competitive advantage	-	-	2	8	17
	IT and business alignment	9	7	5	7	9
	Data security	11	14	18	19	-
Social/ Organisational	Responsive IT infrastructure	-	-	-	6	1
	End-user computing	10	2	6	18	16
	IS Effectiveness	2	5	9	16	11
	IS Role & Contribution	-	15	4	11	13
	Business Process Redesign	-	-	-	-	2
	Organisational learning	8	6	3	5	14
MEANS Technological	Technology integration	-	3	10	-	-
	Software Development	13	4	13	9	6
	Multivendor open systems	-	-	14	12	18
	CASE	-	-	-	11	-
	Disaster recovery	-	-	-	20	-
	Decision support systems	5	10	-	17	-
	Distributed Systems	-	-	-	12	3
	Legacy Applications	-	10	15	16	15
	Information Architecture	-	-	8	1	4
	Office Automation	6	12	-	-	-
	EDI	-	-	12	14	19
	Collaborative support systems					11
	Data resources	4	9	7	2	7
	Communication networks	3	13	11	10	5
IT Experts	IS Human resources	7	8	12	4	8
IT Users						
Meta Architecture	Strategic planning	1	1	1	3	10
Social Environment	Outsourcing	-	-	-	-	20

When carefully studying the issues presented in table 6 above it stands clear that these issues have evolved during the last fifteen years. Even though these changes have not occurred in a radical way some changes in trends have taken place.

We can see that IT-management focus has laid primarily on managing issues of end and mean character. Some issues have only appeared among the top 20 issues during one or two of the studies and we interpret these to be time dependent. None of the issues have been at a constant high level but some have occurred in all the surveys and can thus be considered less time dependent. These are organisational learning, end-user computing, IS effectiveness measurement, IS organisational alignment and as the bright and shining star, strategic planning with a constant presence among the top ten issues. Strategic planning has lost positions in the last studies. This might indicate that the speed and demand for flexibility of the present time is not met by strategic planning. We think that it is possible to see a trend over the years were technical issues have been downplayed and social and organisational ends are of greater relevance. The strongest trend that we can see is that of the emergence of a responsive IT infrastructure as issue number one during the latest survey and information architecture that also had a high rank during the last three surveys.

We can see that issues vary with time. There is a pattern between the different eras of IT-management presented earlier and issues considered important. This can be explained by some kind of "follow the leader" mentality or by that a majority of companies are tactile. Maybe managers focus on problems and some of these issues are seen as problems only because attention has been drawn to these issues by articles in magazines and trough discussions with other IT-managers. This theory is confirmed by our empirical studies among Swedish IT-managers. Is it otherwise possible for companies that have different cultures and behaviour to experience the same kind of problems at the same time? Maybe companies are run in identical ways regardless of geographical location? If this is the case it is a "follow the leader" mentality were companies work in the same way and therefore does not achieve strategic opportunities.

13.2 CLASSIFICATION ACCORDING TO ROOM DIMENSION

Table 7: The room dimension[13]

Areas	Room dimension in IT management		
	US	South east Asia	Sweden
ENDS Social/ Organisational	Data Security IS Effectiveness Competitive advantage Responsive IT-infrastructure Business Process Redesign End-User computing IT and business alignment IS Role and contribution Organisational Learning	Top management support Goal alignment Competitive advantage Data Security IT and business alignment User friendliness of IS IS Effectiveness Responsive IT-infrastructure Organisational Learning Communication with end-users	Standard application systems Linking regional areas/co-ordinate (linking people) The Right people in the right place Knowledge management Use Internet to make business Cognitive conformity II and business alignment Create a work-process for the IT-function Adapt a holistic view point IS Role and contribution IS Effectiveness Responsive IT infrastructure Competitive advantage Organisational learning
MEANS Technological	Data resources Decision Support Systems Legacy application Information architecture EDI Multivendor open systems Communication networks Collaborative Support Systems Disaster recovery Distributed systems Software development CASE	Data resources Technology Integration Database Management systems Information architecture Software development quality DSS Preventing viruses Office automation Telecommunication systems Computerisation of routine works Disaster recovery Application portfolio Distributed systems CASE	Common IS architecture Fast communication
IT Experts	IS Human resource	IS Human resource	Power of IT suppliers Competence of IT suppliers Human resource management
IT Users			Common user interface Social networks IT people support users
Meta Architecture	Strategic planning	Strategic planning Evaluating IS organisational impact	Balance between central guidelines and local responsibility Internet strategy Understanding/Adapting ideas Improvement of social contracts Strategic planning
Social Environment	Outsourcing		Outsourcing

[13] In this table we present those issues that have been chosen after 1989 in the SIM study thus from 1993 in reality, the Asiatic studies and the two Swedish studies (our empirical and the study from 1993).

When comparing the different studies we can see that the factors found in our empirical study are very similar to issues found in studies performed abroad. This confirms our statement in the introduction that Swedish companies are quick to adapt to foreign management concepts. However issues considered important in Sweden differ to some extent from the ones conducted in Asia and the US. Issues considered important by Asian and American IT-managers coincide even more. Meta architectural factors seem to be more important in Swedish companies while technological factors are more dominant in studies performed abroad. IT-maturity in Swedish companies is relatively high compared to other countries and this might come as a consequence to the focus on meta architectural issues.

Note that the degree of comprehensibility of ends is fuzzy. This is due to the fact that social relationships among people might be asymmetric, conflicting, contradictory etc. In any case, ends reflect expectations of people.

PART VI: DISCUSSION AND CONCLUSION

14 DISCUSSION

In this section we discuss the results of our research.

14.1 IDENTIFYING IMPORTANT FACTORS

The process to identify important issues forces us to priorities between the importance of different factors and their relevance for the prosperity of IT-management. It is a hard task to decide which factors are strategic out of the ones that have been judged important in our study. As we have seen these factors differ in room and time. Maybe not radically, but they differ. Therefore we believe that the issues of greatest interest are the ones that have been proven to be both independent of time and room (see figure 12). They have remained important to IT-managers through history and in different cultural settings, even though radical changes have taken place.

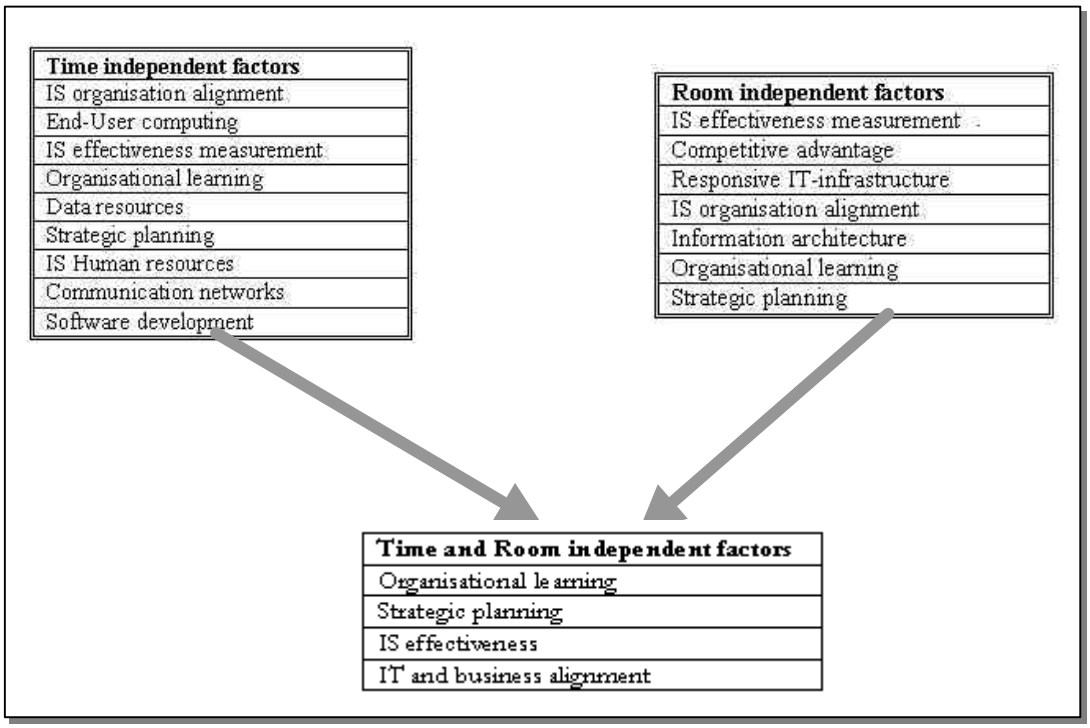

Figure 12: Time and Room independent factors

As stated in our theoretical framework **strategic planning** has become a less useful tool due to rapid changes in the environment. Organisations focus instead on strategy, but since strategic planning is an issue that has been considered important by IT-managers, we deal with it in that form. This might also be a question of misinterpreting terminology, where the difference between strategy and strategic planning does not seem clear. Note that the product of strategic planning is a master plan whereas the product of strategic thinking is expressed in terms of strategy.

"It is not possible to meet the future with detailed five year plans, either in the form of long range plans or as strategic plans. It is like trying to navigate after a map in terrain that is unknown and that changes all the time." (Alarik, 1998)

According to Alarik (1998) it is time to give up hope about finding the correct strategic steering instrument. But somehow we need a way of taking the right course otherwise companies will suffer the risk of wandering around in circles and ending up on the same spot were they started from. A change of view is necessary says Alarik (1998) because development deals with processes and therefore strategic thinking must be process oriented.

IS effectiveness is a strategic factor in the international pattern in a world characterised by turbulent and in many case incomprehensible changes in the short term. Accordingly the best measure for IS effectiveness can be given in terms of contribution to the expectations of people and organisations to improve quality. In this term any isolated short term evaluation of IS effectiveness can lead to a dysfunctional state of development.

Organisational learning should not be interpreted in terms of teaching technology but rather in terms of socialisation such as workshops and intellectual infrastructures providing the means for perspective making and perspective taking. In this sense organisational learning create the means for comprehensibility, awareness of wholeness and continuity or motivation.

As we have stated earlier in this thesis **aligning IS with business** i.e. the organisation is a root architectural question. Thus it is the very core of IT-management.

14.2 RESULTS ACCORDING TO THE SWOT MATRIX

When applying the SWOT matrix on the factors we have found important we discovered that they were all internal issues. That is they could only be classified as strengths or weaknesses. Therefore the thought behind using the matrix to analyse these factors has lost its value.

This should perhaps not come as a surprise to us since we, when conducting our empirical study, discovered that respondents were extremely focused on issues concerning internal factors. The respondents talked about and focused on factors that were problematic and seen as organisational weaknesses. It is also our belief that it is much easier for companies to focus on internal issues since they lay within control and also because they are easy to grasp and understand. Results and profits can also more easily be accounted for to top management. Issues that lay outside the manager's immediate control become more hazardous to the decision-makers involved. Companies are trapped in organisational thinking failing in seeing the world around them. This might lead to missed opportunities and an inability to discover threats in the environment.

14.3 CONFUSION OF CONCEPTS

As mentioned in the introduction, concepts have different meaning depending on who is interpreting them. This makes it difficult for us to analyse the issues we have found. When discussing how differently people interpret the same concept we use Infrastructure as an

example. Infrastructure was the number one issue in the 94-95 SIM study. We will show how the concept is interpreted by three different sources.

Technology infrastructure includes issues such as responsive infrastructure, information architecture, communication networks, and distributed systems that are focused on the integration of technology components needed to support modern business applications and databases (Brancheau, 1997). This was the intended interpretation by the researchers in the SIM studies and has a technical focus.

Infrastructure can also be viewed as integrated architecture incorporating information: information access, information management, communications management and presentation (Baskerville et.al, 1994). Thus it has its focus mainly on issues of information and not on technical issues.

Infrastructure can also be viewed as the totality of supporting functions that allow the design activity to take place. Thus, the designed infrastructure includes provision of technology support in the form of appropriate engineering, designed hardware and software platforms. It also includes a variety of organisational and cultural elements including methodologies or guidelines, procedures for knowledge management, enhance skill levels, improve job satisfaction and encourage the frequent, personal sharing of information and knowledge (Hollier et.al, 1992). This definition encompasses both issues of a technical character and questions of a social character.

The point that we try to make by showing these different interpretations of the same concept is that this problem makes IT-management a complicated area due to the fact that the same concept is interpreted differently by different actors. It is hard to perform studies like this one since there is confusion about the main concepts. Even if it is clear to us how a concept should be interpreted, it might have a different meaning to someone else. Another example of this is, when one of the respondents in our study stated that IT-management was not a correct definition of what we meant, instead this respondent wanted us to name the concept IT governance. He said that management works on an operational level while governance is the correct word when studying strategic issues.

14.4 ROOT ARCHITECTURE: MATCHING IT WITH BUSINESS

Our research shows that the one of the fundamental building blocks in IT-management is the alignment between IT and business. There has been a lot of discussion within the area and several articles: (Groenfeldt, 1997), (Richard, 1998), (Bakos & Treacy, 1986), (Nath, 1989) and books: (Robson, 1997), (Boar, 1995). The surveys performed in the US, Taiwan and Hong Kong also support the findings of our study that aligning IT and business is the root in IT-management.

Why is it that the gap between IT and business deserves special attention? One answer is that IT is in a state of continuous and rapid evolution that widens the gap. IT also has a huge impact on every aspect of business- products and processes, jobs and structure. A survey shows that 74% of the respondents recognised the existence of a gap between IT and the business in their own organisations (Codd, 1998). Almost half of them recognised the gap to be big or very big. More than half agreed that it was hurting the business.

Literature states that it is difficult to close this gap because there are several different aspects to it. The different issues have to be tackled in different ways. IT-management has to deal with both soft components, as collaboration and relationships and hard components such as practical IS management and process issues. This question is further complicated because of the fact that IS directors have low credibility due to poor IS performance both at present time and historically. This in turn erodes the attempts to create a constructive partnership with the business.

14.5 INCREASING NEED FOR IT-MANAGEMENT

During our study we discovered that the figure (figure 1) presented in part one is not sufficient to portray the situation in Sweden at the present time. Below we present a contradictory conclusion on the subject and we propose another way of portraying these gaps of opportunities.

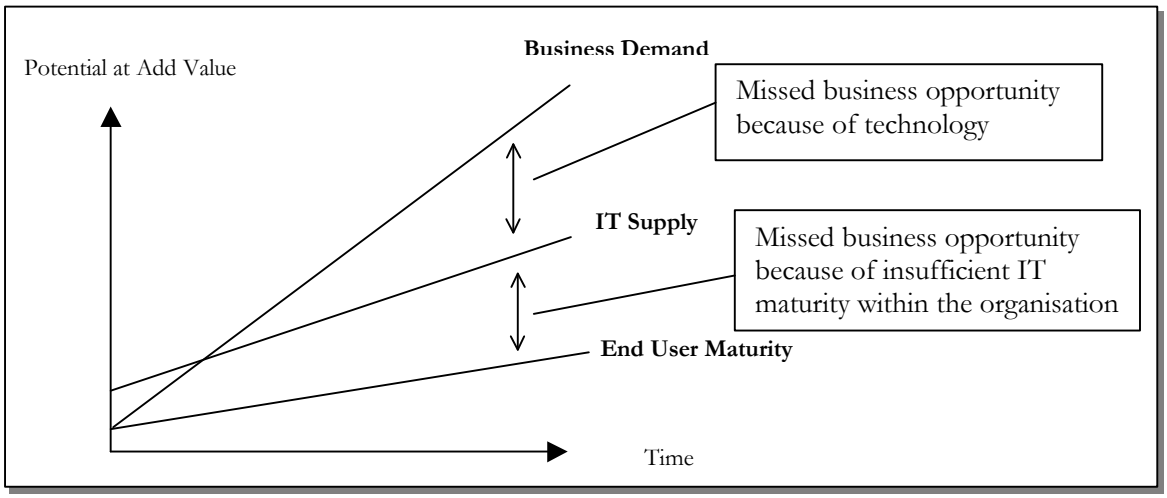

Figure 13: Portraying the gap

Figure 13 portrays the gap between the solutions that business would like to use in form of IT to gain competitive advantage, which include such factors as increased levels of service, lower prices, new ways of collaborating etc. The problem is that technology does not reach this level due to several factors such as cost, incompatible soft and hardware, hardship or impossibility to find experts with the right competence to solve the IS/IT issues.

Even if the technical side of IT could live up to expectations IT would probably not be used to its full potential anyway. The reason being that end user IT maturity in most organisations is at different levels than the functionality that is provided by IT. It is therefore hard to reap benefits from the vast amount of functionality that is provided by IT. Some would argue that business demand and end user maturity could not possibly differ due to the fact that IT does not operate without the involvement of users. There are however people within the organisation with sufficient knowledge to see business opportunities. Because of this the business opportunity exists and therefore this gap will be a constraint to the business. One could also argue that there is no difference between IT supply and the maturity of users since IT can not be utilised if users can not use the technology. This is true

but since IT maturity is lower than the functionality of the technology we want to point out this gap as a constraint to business.

15 CONCLUSION

When fitted into the model (figure 2) presented in the introduction we can see that the issues we found to be time and room independent only focus on internal issues giving a halting picture of IT-management. When compared to our model it stands clear that environmental aspects are not represented. The results from our study coincide with Galliers model (figure 7) in the theoretical framework. This model has interrelationships among strategy (corporate strategy), IT-management (cognitive psychology) and organisation (information technology and organisational behaviour) but it does not include any factors related to environment.

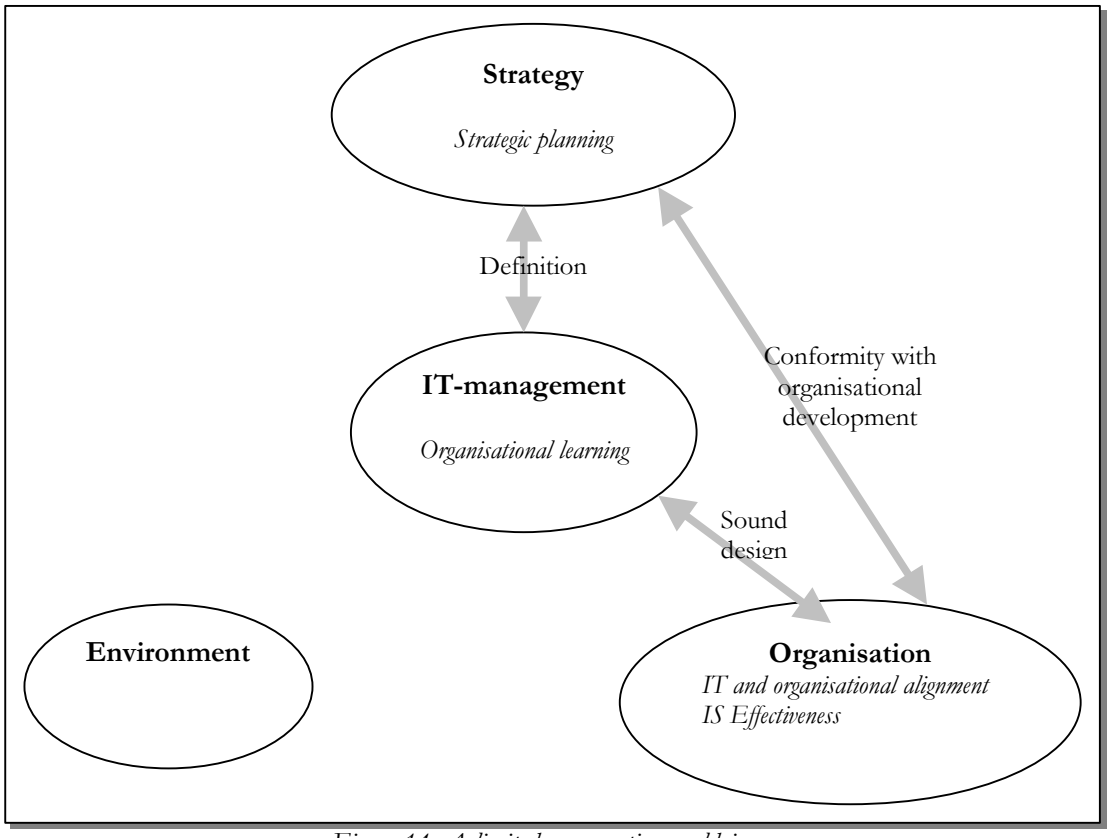

Figure 14: A limited conservative worldview

We have found this to be a consequence of the following circumstances:

IT management focus on internal issues, probably due to several reasons. It is easier to, handle internal issues that are within control, show profits or lowered costs to top management that might result in rewards. The reward system within companies promotes lowered costs while new solutions might mean increased costs. There are not enough incentives to look at environmentally related issues. Without the right incentives available

managers will be scared of presenting new and revolutionising solutions because they might put their necks on the line when suggesting solutions that may be turned down and therefore risking reprisals. Instead managers chooses to go with ideas where the outcome is more or less given, thus avoiding problems. On the other hand no progress or revolutionising solutions will come out of this. Due to historical factors IT-mangers have low credibility, and this is probably a contributing factor when IT-managers are dealing with the environment. IT-managers are extremely pressured by top management because of the inheritance that IT has not lived up to expectations and therefore they have to show clearly that IT investments are effective. Because of this they focus on internal issues where it is possible to make operations run smoother and thereby cut costs. It is also easier and does not require as much to cut costs instead of taking advantage of opportunities in the environment.

Another contributing factor might be that people responsible for IT-management are extremely occupied due to the fast pace within the area and also because they are responsible for systems that are critical to business. Their priorities lay in trying to get operations to run smoothly and they do not have the time or strength to look at strategic issues.

Some of the models and theories used are traditional and this might give a one way perspective. Both CSF and SWOT techniques can be used as instruments for mapping the social/organisational environment as experienced by people but they can not provide a holistic view because they suppress the cognitive limitation of human beings. CSF have an internal character that makes people blind since there is too much focus on internal issues like efficiency instead of quality. Instead we would like to propose our own concept, strategic success factors (SSF), as a better way of viewing IT-management. SSF focus on how an organisation interact with the environment as a part of it.

Our research shows that Swedish IT-management is more open to the environment than their colleagues in Asia and the US. This might be due to the fact that the IT awareness is high in Sweden. IT-managers have started to search for opportunities in the environment but they are still rather sceptical which might lead to missed opportunities and inability to detect potential threats. Feelings towards outsourcing are mixed since companies have been experiencing poor quality and also because they become dependent of the supplier. On the other hand clear economic benefits can be seen as organisations become more familiar with this way of working accompanied by raised competence in ordering.

The effects of Internet and E-commerce are not portrayed in our literature findings since these studies were performed before the Internet revolution which might change the focus of IT-management in the future. This is supported by several articles and also validated by our research in Sweden were several respondents named e-commerce as the big coming attraction. In reality it is probably already here. Since the Internet is a channel to communicate and sell directly to consumers as well as business to business, top management interest in IT-management issues will increase due to the immense possibilities that e-commerce creates. Actually, some say everything is going to be dependent on e-commerce and its possibilities in the future. Since IT maturity in Sweden is comparably high, this issue might rapidly become more important to Swedish IT-managers than in countries were IT maturity is lower.

Our expectations were very high when we started our research and we expected to be able to find strategic success factors, but it was not that simple. IT-management is a multifaceted area, which includes so many aspects of social and technical art that it seems impossible to point out one or more factors as being critical. Importance of factors can vary with the degree of IT maturity, industry, size and organisational culture etc. This is further complicated by the fact that IT-management is involved in almost all areas of today's organisation. This stems from the fact that IT is the enabler when organisations transform and change their way of doing business.

The results might have been more reliable if we were able to support them with more recent findings and perhaps also a large-scale survey in Sweden. The later was impossible due to cost and time restraints. We thought that our chances of obtaining results were better if conducted in a qualitative way. When we monitored the interest from companies to participate in a questionnaire it was very low. Fellow students that experienced poor response rates when conducting this kind of survey support this. In terms of actuality of the studies that we have used, they were the most recent ones we have been able to acquire.

The current study indicates a conservative universal image of organisational development through the use of information technology. The result of our study partly contradicts Magoulas and Pessi (1998) who states; organisational development cannot be described in universal and non-temporal terms. IT-management is more of a cultural phenomenon than a universal science.

If our material is correct and if our empirical investigations are representative to understand the strategic success factor behind development processes we can conclude that there is a universal pattern of co-ordinate development towards economic benefits and socialisation.

15.1 FURTHER RESEARCH

We think it is necessary to conduct new studies in this area since we believe that a lot of the important issues have changed since the Internet revolution. All of the studies that we have used took place before the Internet really took off. Furthermore, a quantitative study could be of great interest to increase the knowledge of the issues, which are considered important in Sweden. As stated before it might be difficult to get a sufficiently large research base. The Internet has probably made companies more aware of the potential opportunities in the environment. However a survey like this will be limited due to difficulties when people interpret concepts differently. Our thesis has given proof of how difficult it is to identify single factors that lead to success since they all function in a cultural context that is dependent on the environment in which it exists.

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Figures

Figures without any reference are a product of our work otherwise the reference to the figure is listed by the figure title

Interviews

Company A

Position	Date
IT-manager	990422
Business manager	990422
Human resources	990426
IT-controller	990510
Vice IT-manager	990422
Regional manger	990507
IT- co-ordinator	990416
Site manager	990428

Outsourcing partner to company A

Position	Date
Partner co-ordinator	990414

Company B

Position	Date
IT-controller	990414

Company C

Position	Date
IT-controller	990222

Company D

Position	Date
IT-manager	9905

Other sources

Long and fruitful discussions with our tutor, Ph.D Thanos Magoulas, 1999

PART VIII: APPENDIX

16 DEFINITION OF RELEVANT CONCEPTS

Issue[14]	**Meaning**
Adapt a holistic view point	Look at a situation from all angels
Application portfolio	Collection of different applications
Balance between central guidelines and local responsibility	Central guidelines cannot be too severe because this will limit the local initiative and local responsibility cannot be too large sice this will limit the performance of the whole..
Business Process Redesign	Changing business decision and working process dramatically to improve the competitive ability of the organisation.
Cognitive conformity	When people have a common view on things
Collaborative Support Systems	Lotus Notes is one example
Common user interface	One interface to all applications that the user feels familiar with
Communication Networks	Networks to facilitate communication
Communication with end users	There have to be a constant dialog with end-users so that they feel involved in the development of business
Competitive Advantage	Using IS to create business competitive advantage.
Computer Aided Software Engineering	Using computer aided engineering technique to help IS development
Computerisation of routine works	Work that is done repeatedly and can be effectively computerised.
Core competence	What the company does best and were their main competence is concentrated
Create a work-process for the IT-function	Guidelines and policies that can standardise the work-process
Database management systems	Systems that support managers in their work.
Data Resource	Managing business data resource so that they can be accessed and utilised appropriately.
Data Security	Protecting software and hardware to prevent information from being changed destroyed or stolen by illegal users.
Decision Support System	Planning and implementing decision support systems and executive information systems to support manager decision processes.
Disaster recovery	To be able to fast recover from system crashes etc
Distributed systems	Data are decentralised and located at many different places
EDI (Electronic Data Interchange)	Exchanging inter-organisational data in predefined format trough communication.
End-User Computing	Supporting end-users to develop and manage IS by themselves to solve their own problems.
Evaluating IS organisational impact	How the use of IS affects the organisation
Fast communication	To be able to communicate without time lag
Goal alignment	Align the organisation so that it can achieve goals
Improvement of social contracts	Improve understanding among managers and employees

[14] Issues presented in the studies

Information Architecture	Developing business integrated information architecture to assure the major information requirements and system structure of business processes.
Internet strategy	A clearly stated strategy for the use of Internet to make better business
IS Effectiveness	To measure effectiveness in IS
IS Human Recourses	Human resources specifically focused on IS/IT personnel
IS Organisation Alignment	Locating IS properly to get the best benefit
IS Role & Contribution	Define what IS should be used for and in what way
IT people support users	IT experts need to understand users and vice versa.
Power of IT suppliers	Suppliers control over how IS is run within the organisation
Competence of IT suppliers	IT suppliers need to be competent to do a good job
Knowledge management	A way to preserve knowledge in the company so that it can be used by others and so that it will remain within the company if the person who has the knowledge leaves.
Legacy Applications	Maintenance and future relevance of already existing applications
Linking people	Good communication over geographical and functional borders
Office Automation	Planning and implementing office automation to increase the productivity of white-collar personnel.
Organisational Learning	Organisations should learn from what it experiences and hereby it is possible to avoid making the same mistakes repeatedly.
Outsourcing	Letting another company handle the support of some or all of the IT-function
Planning and Integrating Multi Vendor Open Systems	Establishing software, hardware common standards or protocols to achieve compatibility among different supplier products.
Preventing viruses	State clear policy's for the use of computers so that viruses cannot be spread easily
Responsive IT Infrastructure	An infrastructure that can be adjusted to new and changing needs.
The right people at the right place	The person best suited for the job should do it. For example project managers should be good at project management which does not necessarily mean that this person is an expert.
Social networks	Networks where people with the same interest can communicate.
Software Development quality	Increasing efficiency of software development trying to satisfy business needs.
Standards	Policy and guidelines for the infrastructure
Strategic Planning	Integrating IS resource plan with business overall plan and strategy
Telecommunication systems	Systems for telecommunication.
Technology Integration	Technology should be able to function together with other technologies.
Top management support	Employees must feel that the have the support of top management
Understanding/Adapting ideas	To understand and adapt ideas coming from the organisation
User friendliness of IT	User friendly design of IS that makes it easy to use.